MAR. 31 1961

PETROLEUM WEEK

A McGRAW-HILL PUBLICATION

Crude postings take a firmer tone 13
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Roads that taxes paid for...but were never built... page 14

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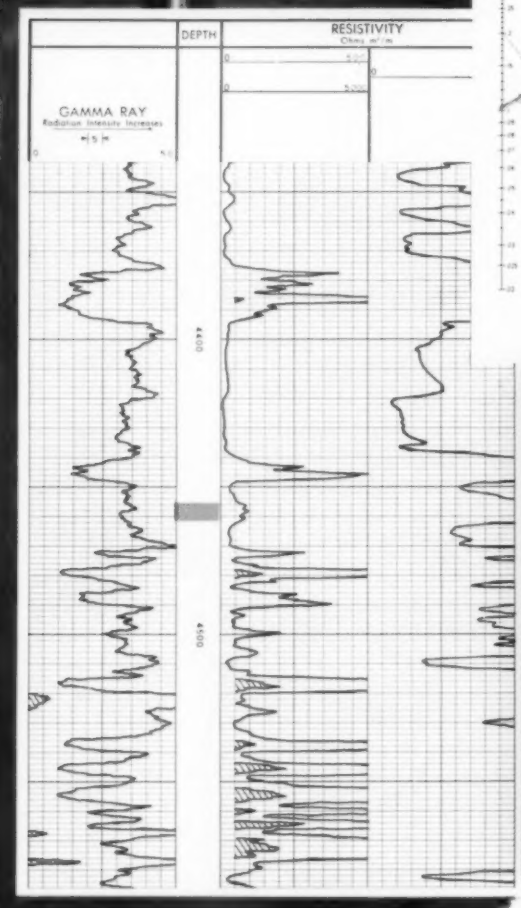

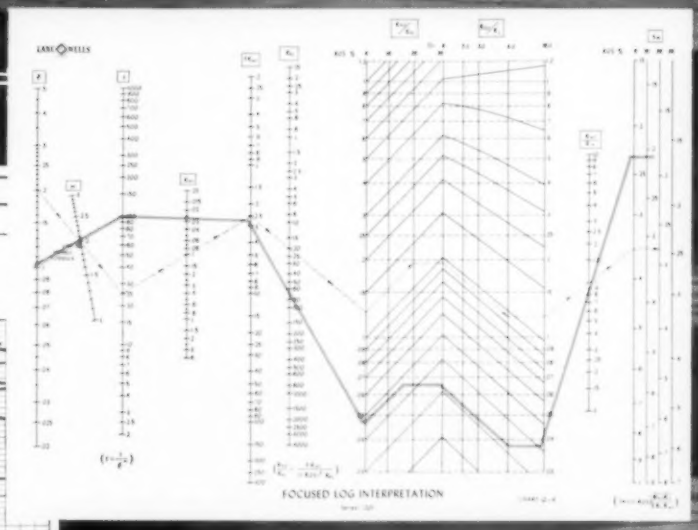

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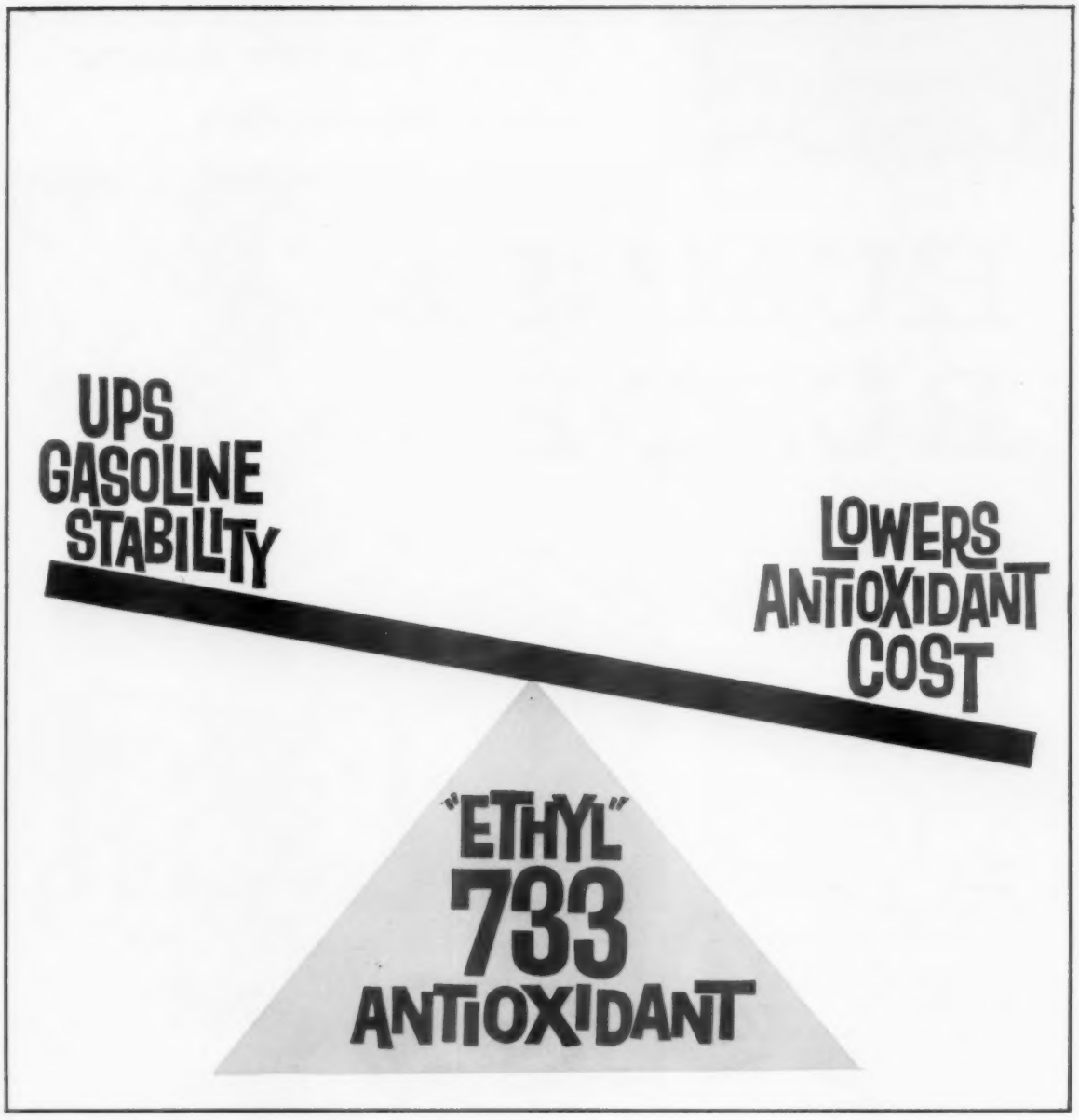

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inseparable new coating cuts offshore costs

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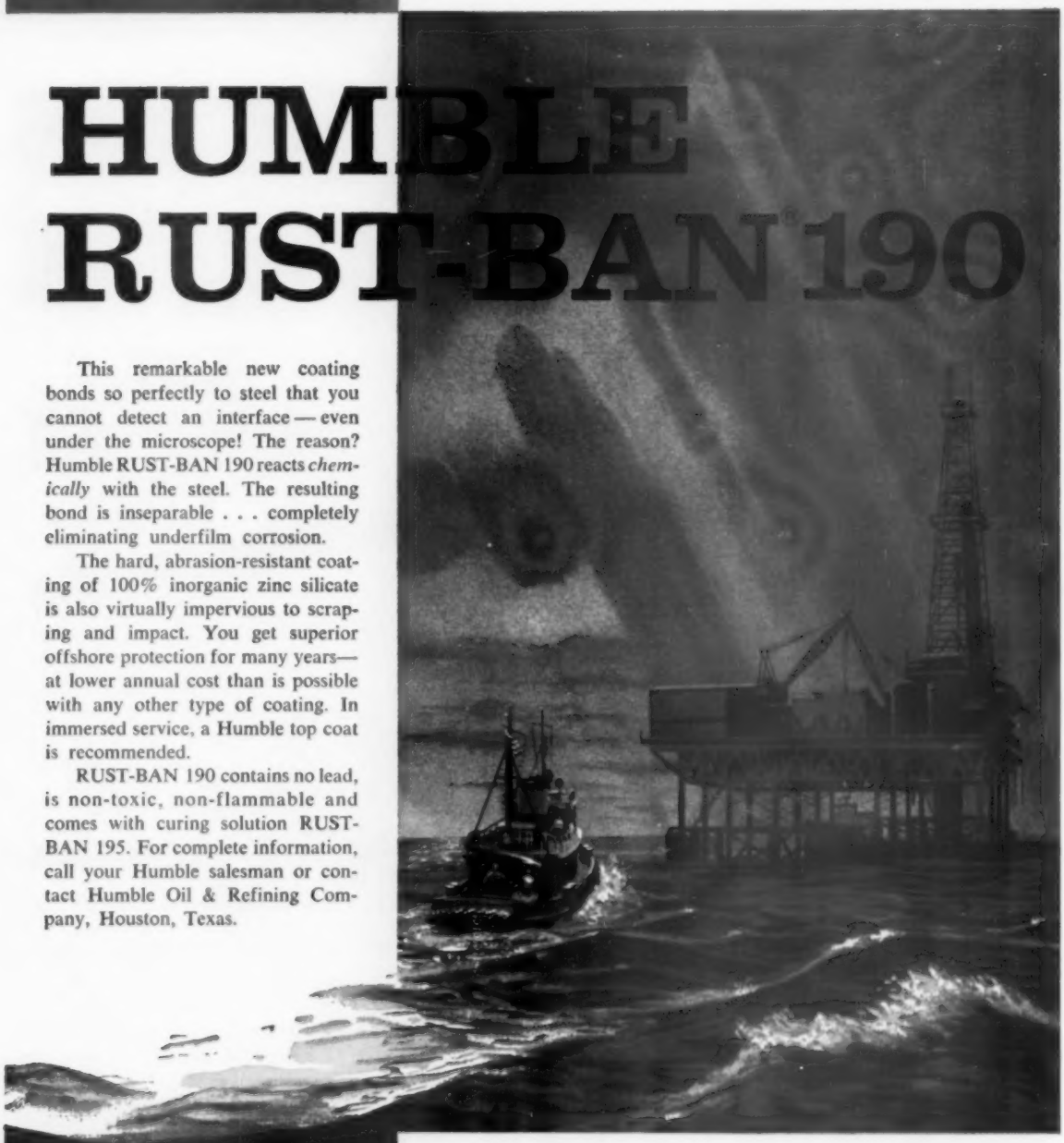

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INSIDE Slant

AN EXACT BUSINESS

The petroleum industry will become as exact as an accounting sheet.

That, in a few words, sums up the ultimate result of the Texas Supreme Court's opinion in the Normanna field case.

There can be no other conclusion reached from the opinion, which has been heralded and attacked within the industry, unless it is upset by legislative action or by the court itself.

The consensus of lawyers and others closely concerned with the issue is that the opinion overturns the "rule of capture."

The Texas Railroad Commission, because of a previous opinion from the Texas court, has operated under that rule in establishing proration formulas. The previous edict not only said a person was entitled to drill his property, however small, but also at a reasonable profit.

With the rule of capture overturned, the person who drills a small tract will be entitled to only the oil or gas which underlies his property.

And the burden of proof of establishing such reserves will fall upon the operator. Of course, he'll have assistance from offset operators.

LeRoy Menzing
EDITOR

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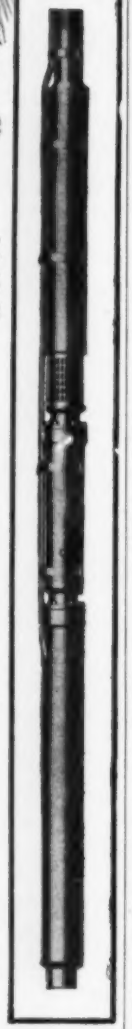

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Views That Make News

AAPG & Zenor's Theory

Dear Sir:

The attention of the executive committee of the American Assn. of Petroleum Geologists has been directed to (1) the article by H. M. Zenor, entitled "Oil May Be Found in Any Type Rocks" [PW—Dec.30'60,p26], and (2) your claim in "Views That Make News" [PW—Jan.20'61,p4] that his theory was based on, and was a continuation of, an article by K. K. Landes et al (AAPG Bull., Vol. 44, p1682).

At its most recent meeting, in Denver, Colo., in February this year, the executive committee requested me to write you and express our unanimous objections to your misleading statement that the Zenor article is a continuation of the Landes et al article. We call your attention to the fact that Dr. Landes and his associates merely reviewed known commercial occurrences of oil and gas in basement rocks and pointed out that the possibility of such occurrences should not be overlooked in programming exploratory wells in certain areas. They did not in any way state or imply that these hydrocarbons were indigenous to the basement rocks, but, instead, were most careful to point out that "all known basement rock accumulations occur where the basement rock is at a higher elevation than the surrounding flanking sediments . . .

"Basement rock accumulations obtain their oil from one of three possible sources: (1) overlying organic rock, from which the oil was expelled downward during compaction, (2) lateral, off-the-basement but topographically lower, organic rock, from which oil was squeezed into an underlying carrier bed through which it migrated updip into the basement rock, and (3) lower lateral reservoirs, from which earlier trapped oil was spilled due to tilting, or to overfilling.

"There is nothing radically different about any one of these sources. Many sedimentary rock reservoirs doubtless received their oil by downward expulsion from an overlying compacting organic shale or calcareous ooze; oil-filled solution pores at the top of a dense carbonate rock section and beneath fine-grained organic rock furnish fairly positive proof of this. There is also ample evidence of spilled oil moving updip and becoming trapped at a higher elevation in the reservoir.

"The only difference in the case of the basement rock accumulation is that the reservoir changes type, from a permeable sedimentary rock to a permeable igneous or metamorphic rock, at the unconformity between the two. For example, where a sandstone laps upon, or abuts against, older fractured granite, there will be no break in the continuity of the permeability, and the two rocks constitute a single reservoir.

"In addition to the movement of oil into basement rock fractures by either downward expulsion or lateral migration, there is also the possibility of it being sucked into the cracks by dilatancy during fracturing. . ."

We wish to disassociate positively both the AAPG and the Bulletin article from any relationship with, or responsibility for, Dr. Zenor's article.

GROVER E. MURRAY
Editor
American Assn. of Petroleum Geologists

Rings a Bell

Dear Sir:

My compliments on the excellent column "Petroleum Comments" entitled "The Profit You Lose May Be Your Own" [PW—Mar.10'61,p20].

I suggest you send tear sheets of this article to all the leading refinery presidents as well as to their directors of sales.

I believe your comments should be particularly "hintful" to the refiners at the Gulf Coast and in West Texas, who are dumping Gulf Coast gasoline either by waterways or by pipeline into the Middle West in order to protect their incremental barrels.

Your comments are most timely and must be correct because practically every editorial, not only in your good magazine but in others of the industry, has sent up warning flags from unbiased observation posts.

M. LLOYD FREESE
Vice-president
Bell Oil & Gas Co.

Is There a Glut of Oil?

"Is there a glut of oil? The U.S. has coal for 500 years and oil for only 12 years. Yet we hear talk of a glut of oil and never talk of a glut of coal. The Free World has oil for only 36 years, and the rate of consumption is increasing. The oil industry fears, not a glut of oil, but rather a lack of adequate reserves.

"Yes, it is possible to produce oil

at too fast a rate, and all over the world there are various schemes to control the rate of production. You will hear the oil industry criticized as if it alone is responsible for excess production capacity. And yet land owners and governments all over the world press upon the oil industry to generate for them that income which they consider appropriate. If that income decreases, the pressure on the oil industry increases.

"Here then is our dynamic industry—an industry living in fear of a future shortage of oil and yet decreasing exploration effort today because of present economic conditions."

—J. P. Woods
Director of the geophysical laboratory
Atlantic Refining Co.

Curves Can Be Dangerous

"At this time of the year, increasing the rate of crude production may be likened to a motorist increasing his speed as he enters a curve. Both actions are fraught with danger. The petroleum industry is also facing a curve—a sharp seasonal downturn in demand. And the momentum of an accelerated rate of crude supply could take the industry where it does not want to go—right into the ditch of oversupply."

—John G. Winger
Vice-president
Chase Manhattan Bank

Seizing the Initiative

"I don't see how our obligation to seize the initiative from the critics of our industry could ever get much greater. I don't think we should force ourselves on others. Somehow I get the idea that we often leave the impression that we talk too much, maybe complain a little too much for our own good.

"What I think we should do is to become well informed about our own industry. I think our employees should become well informed and that they should be able to answer questions about depletion, gasoline taxes, the proposed national fuels policy, state and local taxes as they affect our industry, and many other questions they might be asked from time to time. This does not mean that they should get on a soap box or become public nuisances."

—W. J. Goldston
President
Goldston Oil Corp.

Petroleum Week will publish reader comments each week. Address letters to LeRoy Menzing, Editor, Petroleum Week, 330 W. 42nd St., New York 36, N. Y.

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5 Can Be Set With Any Pressure Setting Tool

TYPE BC OTIS WIRE LINE BRIDGE PLUG

Every time you specify the Type BC Otis Wire Line Bridge Plug, you get *5 plus features* designed to help you take the guesswork out of your plugging operations — and yet the plug costs you no more than an ordinary plug. For this reason, many operators have standardized on the Type BC. They found they could successfully run the Type BC where other plugs failed to get down. In addition to the 5 big advantages you get with a Type BC Bridge Plug, you will find it's available from leading electric line service companies and stocked in over 200 different field locations. Take the guesswork out of your plugging operations — the next time you need a bridge plug, specify Otis.

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Type BC Otis Wire Line Bridge Plugs are available in these sizes:

SIZES	CASING WEIGHTS	SIZES	CASING WEIGHTS
2⅞"	6.4 — 8.6 lb.	5½"	13 — 20 lb.
4½"	11.6 — 15.1 lb.	6⅝"	17 — 24 lb.
4½"	9.5 lb.	7"	20 — 38 lb.
5"	18.0 lb.	9⅝"	43.5 — 53.5 lb.

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THE QUALITY OF THINKING

Archimedes, the ancient Greek philosopher, developed principles of mathematics and mechanics which unlocked secrets leading to the development of some of our most modern processes. His mind was at home in the farthest reaches of the abstract, at work in the closest confines of the practical.

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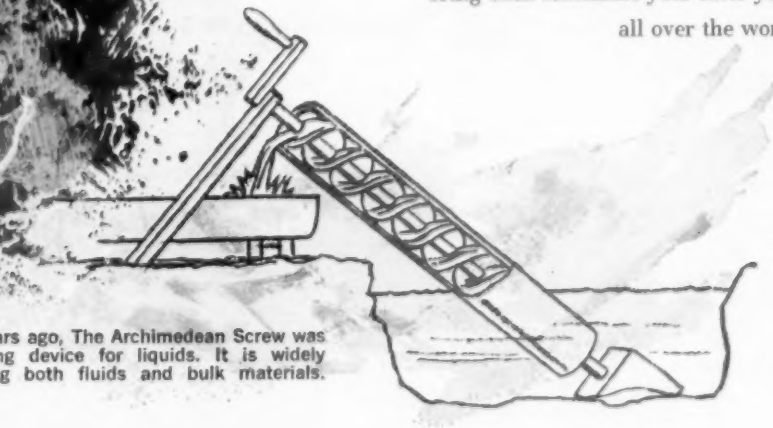

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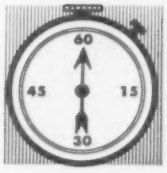
60-Second Summary



THE WEEK'S MOST IMPORTANT DEVELOPMENTS

PETROLEUM WEEK

March 31, 1961

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There wouldn't be a highway problem today if all the taxes levied on highway users had been invested in road programs. Estimates indicate federal and state governments have diverted $12.1-billion in highway taxes since 1925—the equivalent of perhaps 50,000 mi. of roads. . . . p. 14

•

The Export-Import Bank will extend credit assistance on overseas sales of oil equipment to firms controlled by foreign governments. The move is expected to spur export sales by U.S. firms, long hampered by restrictive credit policies. . . . p. 19

•

An advance in postings for sour crude in the Permian Basin is bringing mixed reactions. Some buyers favor the advance initiated by Gulf Oil; others say it came too late. . . . p. 13

•

A once-overlooked pay in southeastern New Mexico is now the target of a busy drilling program. It's a relatively thin Permo-Pennsylvanian section called the Bough C, in an area of south Roosevelt and north Lea Counties. . . . p. 30

•

Refiners have now become the paint industry's major suppliers as well as major customers. Most of the raw materials used to make paints is derived from oil. . . . p. 55

•

Japanese and Italian newcomers to the Middle East are getting set to start production in the Persian Gulf. Exports to Japan will begin next week. . . . p. 51

•

Double-jointing of pipe in yards en route to spreads is paring pipeline labor costs. The method, which reduces the number of welders needed, is being used in the building of the U.S. section of a gas line from Canada. . . . p. 65

•

A geophysical tool that imparts energy through surface vibrations will soon be available for general industry use. Known as the Vibroseis, the tool permits control of the introduced energy signals. . . . p. 29

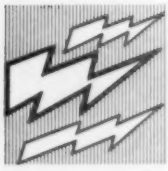
•

The odds against wildcat successes are getting tougher. The latest study shows that the chances of hitting a profitable exploratory well are now 1-in-45, compared with the previous mark of 1-in-43. . . . p. 16

•

Thirsty supersonic jets will boost demand for jet fuel by 300,000 b/d by 1975. This fuel will have to be tailored to possess special quality features—particularly thermal stability and low volatility. . . . p. 60

Up to the Minute



SIGNIFICANT LATE NEWS

PETROLEUM WEEK

March 31, 1961

The Interior Dept. will review the entire oil imports program, except for residual fuel oil, at two hearings, probably in May. The officials are aiming at a timetable that will give prospective participants time to prepare for the full-scale hearings, and that will permit possible changes to start with second-half allocations. One hearing, for District 5 imports, will be on the West Coast; the other will be in Washington.

With the new hearings, Washington sources see Interior Secretary Udall moving into the dominant role on imports. This means that the Office of Civil & Defense Mobilization, which now has the role of general surveillance over the effects of import controls, may be in a declining position on import regulations. Originally, it was OCDM that certified that controls were necessary in the interest of national security.

•

Lower distillate prices spread to the eastern seaboard this week, reflecting reductions at the Gulf Coast, and lower tanker rates. Humble Oil & Refining Co. initiated the move in the east with reductions ranging from 0.2¢ to 0.5¢ a gal.

•

Texas lost again in the courts this week in its attempt to collect a natural gas "severance beneficiary" tax under a 1959 law. The Texas Supreme Court this week refused to review the 1960 decisions of two lower state courts that the 1.5% tax upon the value of gas places an undue burden on interstate commerce. The tax was aimed at the "beneficial" purchaser of gas.

•

Gulf Oil Corp. won a victory over an Oklahoma Corporation Commission "must buy" order this week after nearly five years of litigation. Oklahoma's Supreme Court ruled that the commission could not force Gulf to purchase crude it did not want. The case dates back to a July, 1956, order prohibiting any purchaser from prorating its take of crude without permission.

The commission's controversial forced-purchase order was held illegal—the first such decision in the long case. Gulf was cited for contempt by the commission after it instituted purchaser proration in July, 1956, and was fined $305,000. Gulf challenged the order before a federal court in Oklahoma City, which ruled that the issue should be handled in the state's courts. The U.S. Supreme Court upheld that ruling in June, 1957, without passing on the real issue in the case. Gulf then turned to the Oklahoma Supreme Court, which ruled this week that the commission did not have the authority to direct a purchaser to buy all the crude available under an allowable order.

•

Automation became an issue in a strike against Texas Gas Corp. this week. An Oil, Chemical & Atomic Workers Union local posted pickets at the company's Winnie (Tex.) plant following a breakoff in negotiations over the layoff of 11 employees. Texas Gas said the layoffs were due to installation of automatic controls.

Today's Discoveries Are Yesterday's Dry Holes

Welex's Simplified Logging Program today logs many discovery wells in areas once called "dry hole" country.

Thanks to modern techniques, such as the Welex program, you can now pinpoint and produce profitably many pay sands, ignored by old-fashioned logging tools a few years ago.

The Welex Simplified Logging Program does this for you ACCURATELY and FAST.

Introduced to eliminate confusion and complicated computations, the Welex program within minutes gives you the answers to the two main questions — WHAT IS THE POROSITY and WHAT IS THE FLUID SATURATION.

Based on only two factors — type of porosity present and drilling mud/formation water salinity contrast — the Welex Simplified Logging Program makes selection of the BEST LOGGING PROGRAM for every well easy, as shown by the diagram here.

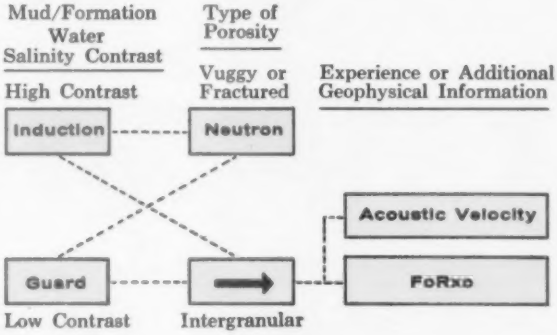
The addition of Welex's Acoustic Velocity Log to the program makes even more information available to you. The Acoustic Velocity Log, with Caliper of course, is the ideal choice in:

1. Formations where experience or past performance indicates that its porosity values are more accurate.

2. Areas where velocity data is desired for geophysical purposes.

As with the Welex FoRxo and Neutron Logs, you can read porosity values directly off the Acoustic Velocity Log. When run in conjunction with the Welex Induction or Guard Log, your most important question — WILL THE WELL PRODUCE? — can be answered in minutes by using the Simplified Interpretation Charts or "pigtails" printed right on the log.

The Welex Simplified Logging Program IS THE ANSWER for your well.



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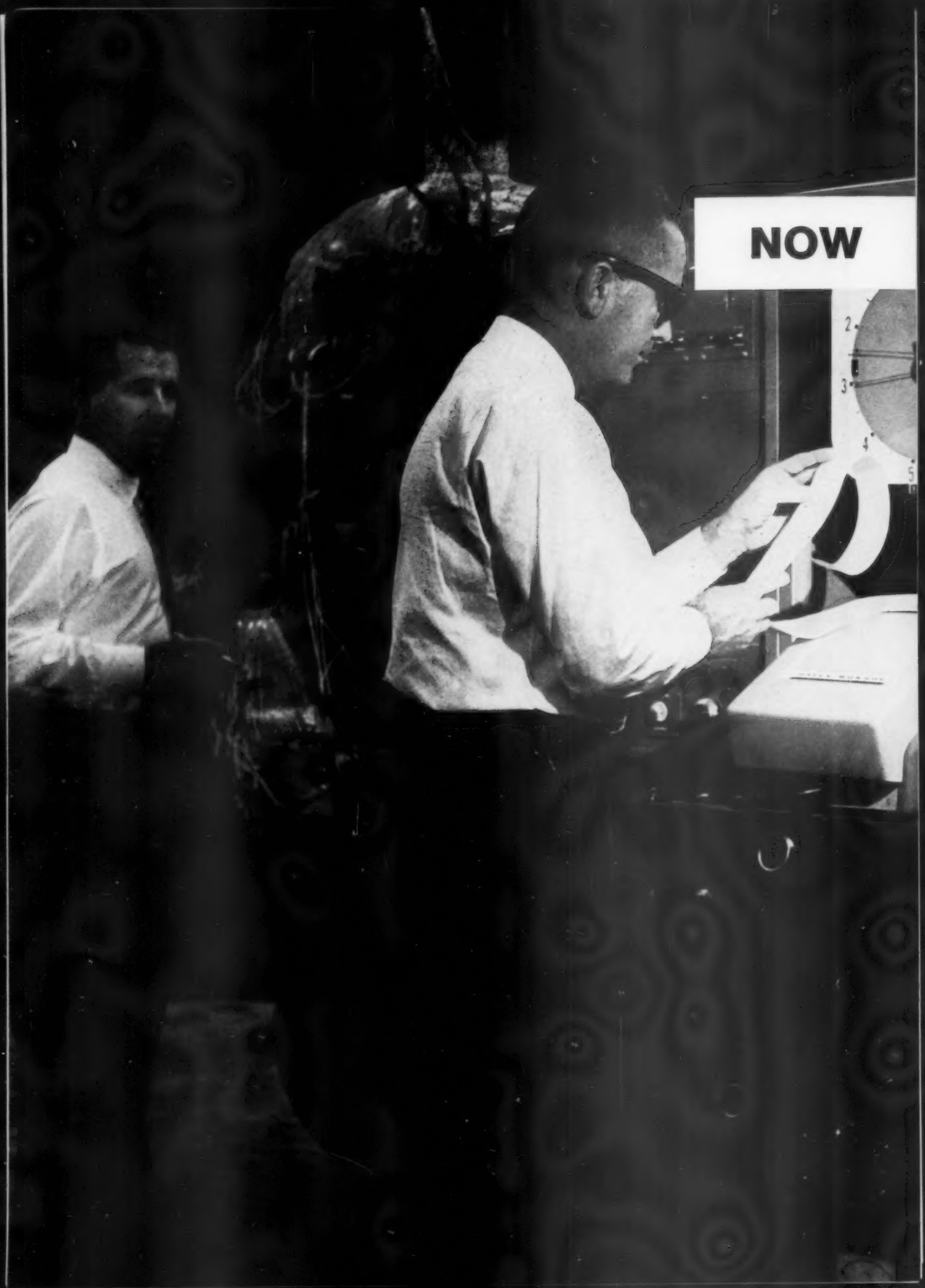
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Permian Price Hike Stirs Market

Gulf's advance in sour crude postings in the Permian Basin brings mixed reactions. Some buyers say sour oil has been underpriced. Others say the timing is wrong.

The crude market is showing signs of strength this spring as selective increases in postings continue to be made in several areas.

The upward adjustments are being made in areas ranging from the Rockies to the Southwest—despite some indications of oversupply, as reflected in product price weakness and moves by several companies to reduce refinery runs from the high winter peaks.

Humble Oil & Refining Co., for one, made a second reduction in its March runs, cutting its rate to 787,000 b/d for the month.

The most significant show of strength in the crude market was last week's advance in postings for sour crude in the Permian Basin of West Texas and southeastern New Mexico.

Gulf Oil Corp. initiated the advance. The company placed its postings for sour crude from those areas on its schedule for Permian Basin intermediate crude.

That amounted to a 6¢-a-bbl. increase in its posted price for 40- to 44.9-gravity oil, and a sharper advance for gravities above 44.9 and below 40, due to a reduction in the gravity differential from 3¢ a bbl. per degree to 2¢. Gulf's price for 32-gravity, for example, was advanced 14¢ a bbl.

An increase in West Texas postings was predicted by PETROLEUM WEEK in mid-February (below).

Reaction to the increase in Permian Basin sour crude was mixed this week. Some purchasers agree that the sour oil has been underpriced, while others question the timing of the advance.

Gulf attributed its advance to an increase in value of products realized from sour crude.

There is hesitation on the part of other crude buyers to commit themselves on whether they will follow

"After all," says one major, "different companies place different values on different crudes."

Another buyer, noting that a substantial volume of the oil affected by Gulf's move is the company's own production, says there is not too much competition for the Permian Basin crude taken by Gulf.

Nearly all of Gulf's Permian Basin sour oil goes to its Port Arthur (Tex.) refinery.

Some buyers predict that a two-price pattern for Permian Basin sour oil might "hang on for a while." Others say the advance will have to be followed.

Standard Oil Co. of Texas was the first purchaser to meet the higher posting. Its increase, effective Mar. 27, affects 2,000 b/d in the Yates and Cordonna Lake fields of Pecos and Crane Counties, West Texas.

The crude buyer for another company says that an increase in West Texas sour prices "has been under consideration for quite a while."

One purchaser says Permian Basin sour oil has been "underpriced" in comparison with other grades.

"With the differential in prices between West Texas and the Gulf Coast, there has been a tendency for some crudes to be long and others short," he notes. "The increase in price will stabilize the Texas crude picture."

Some companies in the Southwest predict that unless Gulf's advance is met, they may lose connections since, as one put it, "every producer is looking for a better price."

There is additional disagreement among crude buyers over the amount of the increase made by Gulf. A few who say they were in favor of an advance in Permian Basin sour oils say the price hike by Gulf was too much.

Some purchasers say that placing sour crude on the same price schedule as intermediate could discourage additional refiners from becoming sour oil users. Their reasoning is that because of the extra costs of equipment plants to run sour crude, its use is profitable only when it costs less.

PETROLEUM WEEK / February 17, 1961

Crude Price Outlook Improving

- **Producers are optimistic that upward adjustments may be made by areas, ending the long period of erosion in field postings.**
- **The optimism is based primarily on the sharply increased refiners' margins in 1961, coming on top of a strong final six months of 1960.**

There is growing optimism among producers that some increases may be made in crude prices. A general advance in postings is not anticipated, but rather selected boosts for specific types and areas.

The feeling springs from the level of improved earnings in the industry—both the reported data for 1960 and the expected strength that will be reported for the first quarter of this year.

A good part of the anticipated early-1961 earnings will result from the unusually strong demand for heating oils. But producers are noting that in the first month of the year demand for gasoline was running 2.5% over 1960, despite poor driving weather in many parts of the U.S.

Total demand for the month was up 6.4%.

Producers' optimism stems primarily from the improved level of refiners' margins, now the highest since the fall of 1957.

Refiners' margins—the realizations from products sold over the prices paid for crude—averaged $1 a bbl. in January. With four increases in distillate prices in the first two months, indications are th[illegible]

The improved position so far indicates that the average margin for all of 1961 will top the figure.

Estimates of an increase in demand for domestic crude this year, amounting to about 3%, over 1960, add to the optimism.

That would mean that production for the year would average 7,250,000 b/d. This assumes that the permissive level of imports will follow the pattern of 1960, which is now generally anticipated regardless of the review of the program that will be made.

Support for the producers' optimism also comes from indications that the Texas Railroad Commission, in particular, plans to keep a tight rein on allowables.

The Texas regulation agency has indicated in setting allowables so far in 1961 that it wants to prevent unnecessary buildups in crude and product inventories, by holding the permissables in line with seasonal demand.

As a move in that direction, the commission has decided against calling for company estimates [illegible]

Earlier this month, Continental Oil Co. discontinued separate postings for low-gravity, asphalt-type sour crudes in the Rocky Mountains.

Under its new schedule, those crudes are posted with higher-gravity oils, bringing an 8¢-a-bbl. upward adjustment for 10,000 b/d.

In California, Union Oil Co. made an upward adjustment of from 3¢ to 7¢ a bbl. for crude from the Beverly Hills and Culver City fields.

The most significant area in which producers now expect upward adjustments to be made is West Texas.

Demand for Permian Basin crudes has been extremely strong for several months, with some companies admitting that it is their most profitable oil at the refinery.

Should a price increase come, it may be initiated in West Texas and spread to other areas.

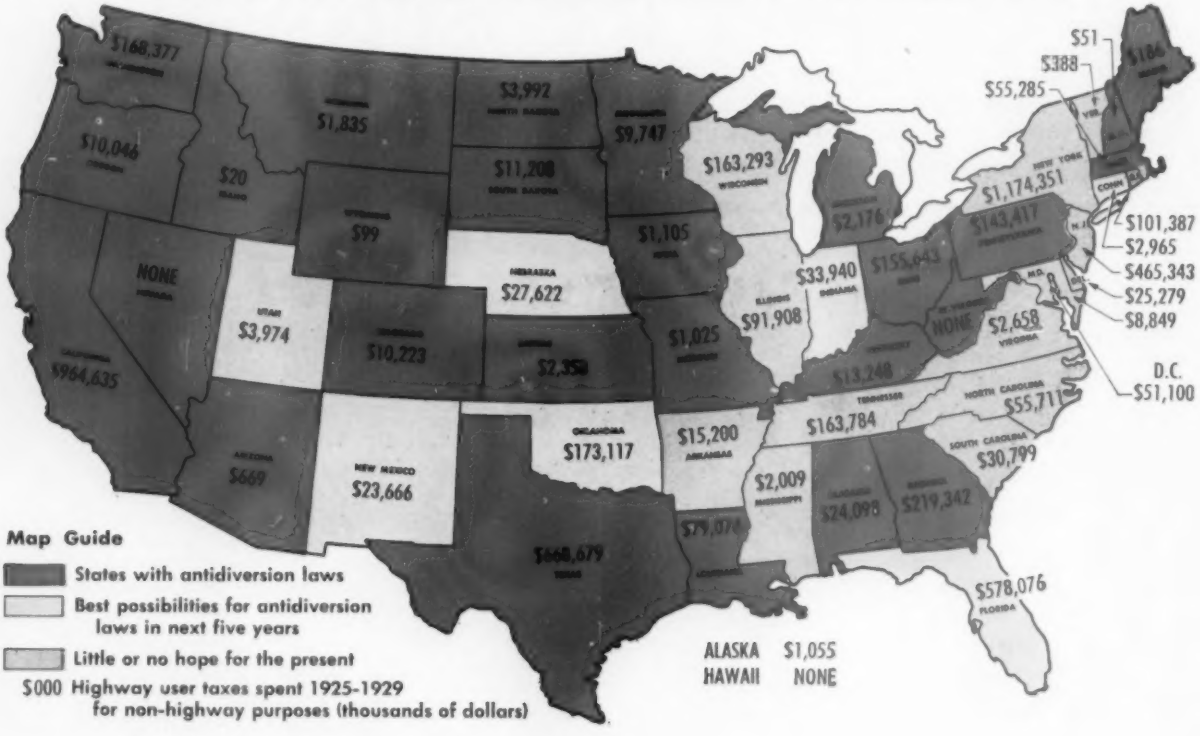
Postings for Permian basin crudes generally were raised less than the rest of the U.S. when the last general increase was made in January, 1957.

And prices in the area have eroded more in the downward trend of postings since.

Any upward adjustment in domestic crude prices, no matter how small, would serve as a stimulant to one of the most depressed segments of the petroleum industry—drilling.

Rotary rig operating in the U.S. [illegible] off around [illegible] so [illegible] stimulant

Since 1929 More Than $6-Billion in Highway User Taxes Have Been Spent On Non-highway Projects, Even Though 27 States Have Antidiversion Laws



Diversion Results: Phantom Highways

There are thousands of miles of phantom highways in this country—roads that were never built because the taxes that were collected to pay for them were used instead for prison farms, memorials, and the like.

It would be exceedingly difficult, if not impossible, to calculate the total mileage of these nonexistent highways accurately and conclusively.

But it's a safe bet to estimate that it could run anywhere from 25,000 to 50,000 mi., depending on the starting point, and the interpretation and extrapolation of the figures.

Highway construction currently costs about $300,000 per mi. for a two-lane road. On that basis alone, the estimated $400-million diverted in 1960 from state highway revenues would be the equivalent of over 1,000 mi.

Exactly what constitutes diversion of highway funds is debatable, however, because some states disagree sharply with the interpretation used by the Bureau of Public Roads, the chief source of data.

The federal government agency takes the position that motor fuel taxes, diesel fuel taxes, motor vehicle registration fees, operators' license fees, and so on are highway user taxes, and that these receipts should be devoted solely to road development programs.

It accepts collection and administration charges, highway debt service charges, and even state police items as legitimate debits, in addition to the allotments for state and local roadways.

Anything else, in its eyes, is diversion.

California, Texas, Washington, New York, and others dispute this concept. California, for example, raised its gasoline tax at one point in lieu of a property tax, and specified that this was not highway money, but was to be used for general purposes.

Texas applies one-fourth of all taxes to education, and this is a constitutional provision. Washington has an "in lieu" provision similar to California's. New York puts all of its highway taxes into the general treasury, then allocates highway funds.

There are other variations, too, but the way the Bureau of Public Roads lists them in its regular reports, instances such as these are diversions of highway funds.

Over the past 35 years, diversion of highway funds on the state level has grown to elephantine proportions—aggregating more than $6-billion through 1960.

The idea of using highway revenues for other purposes mushroomed in the depression years that followed the 1929 crash. States dipped into highway funds to pay for emergency relief projects, and to supplement dwindling income for other activities.

Through the years, millions of dollars of highway receipts were poured into a great number of projects totally unrelated to road development.

These included the operation of prison farms, the expenses of parole boards, the building of civic memorials, and the financing of mosquito-control programs, to cite a few. One state even spent a large amount of highway money on oyster propagation.

The map (above) shows the total amounts diverted by each state through the past 35 years.

In recent years.....

(thousands of dollars)

State	1957	1958	1959
Ala.	$290	$21	$510
Alaska	—	—	1,055
Ark.	1,627	1,792	1,922
Calif.	84,595	88,116	94,850
Colo.	1,387	1,375	1,120
Conn.	—	—	1,870
Del.	219	967	1,315
D.C.	5,831	5,977	6,420
Fla.	41,869	45,462	48,266
Ga.	12,073	4,755	26,779
Ill.	946	1,627	1,742
Ind.	1,073	1,037	1,093
Kan.	143	464	460
Ky.	—	—	678
Mass.	—	304	634
Minn.	1,106	1,307	1,454
Miss.	58	658	31
Mo.	99	—	—
N.H.	—	—	13
N.J.	20,307	26,110	47,521
N.M.	1,989	2,092	2,329
N.Y.	23,733	5,965	77,383
N.C.	3,741	3,818	4,154
N.D.	—	121	—
Okla.	9,057	18,550	13,538
Ore.	916	1,168	1,427
Pa.	—	174	—
R.I.	1,728	5,486	5,971
S.C.	1,347	4,193	5,897
Tenn.	16,655	5,005	7,769
Tex.	50,698	51,611	67,480
Utah	130	106	118
Vt.	9	—	—
Wash.	17,198	18,793	21,004
Wis.	6,142	6,272	6,429
Wyo.	—	—	99
Total	**$304,966**	**$303,326**	**$450,276**

Total 1925-1959	**$5,741,959**
Estimated 1960	**400,000**
Grand Total	**$6,141,959**

Highway Trust Fund Is Getting Only 57% Of the Federal Taxes

This is the way that federal excise taxes on motor fuels and certain automotive items were split in the fiscal years 1957 to 1960:

(millions of dollars)

	1957	1958	1959	1960	Total 1957-1960
To Highway Trust Fund					
Motor fuel	$1,326	$1,608	$1,657	$2,044	$6,634
Tires, tubes and tread rubber	93	274	276	316	960
Trucks & buses	34	111	107	142	394
Truck use tax	25	33	34	38	130
Total	$1,478	$2,026	$2,074	$2,540	$8,118
To General Fund					
Automobiles	$1,144	$1,170	$1,039	$1,331	$4,685
Parts & accessories	157	167	166	189	680
Trucks & buses	162	96	108	130	495
Lubricating oil	74	70	74	82	299
Total	$1,537	$1,503	$1,387	$1,732	$6,159
Grand Total	**$3,015**	**$3,529**	**$3,461**	**$4,272**	**$14,277**

Congress set up the Highway Trust Fund in 1956 to underwrite the federal government's share in the interstate highway construction program. On the assumption that this would be sufficient to meet the obligation, Congress dedicated only a percentage of the automotive excise taxes to the trust fund. Spiraling costs and reappraisals changed this picture materially, however, and a temporary penny-per-gallon increase in the gasoline tax went into effect Oct. 1, 1959, to help meet the deficiencies. Oil men feel that all of the automotive excise taxes should be put in the highway fund in preference to continuation of the temporary tax.

The diversion figure becomes almost fantastic when the federal government's $6.1-billion is added to the states' $6-billion, for a grand total of $12.1-billion.

Here again, as on the state level, a precise definition of diversion is a touch-and-go matter.

The federal government's first "temporary" tax on motor fuel was put into effect in 1932 as an emergency relief measure. Other highway-user taxes were added later, particularly during World War II. These taxes went automatically into the general fund.

In 1956, however, Congress passed the Highway Trust Fund Act, and earmarked certain of these highway-user taxes for the interstate highway system.

It became obvious in a year or two that the trust fund was inadequate to handle spiraling costs, and Congress reluctantly raised the federal tax on motor fuel another penny in 1959.

That's due to expire June 30—and that's what all the shooting's about in Washington now. The Kennedy Administration, as did the Eisenhower Administration, wants the last temporary tax extended indefinitely, and perhaps increased another half-cent.

Oil industry spokesmen contend that motor fuel is overtaxed now and that, in addition, Congress in both 1956 and 1959 recognized the principle that automotive excise taxes were, in fact, highway-user taxes.

Thus, the industry position is that the federal government actually is diverting highway funds, and that all of these receipts should be put into the Highway Trust Fund instead of extending or increasing the last temporary tax on motor fuel.

Since the start of the trust fund, $14.2-billion have been collected by the federal government, of which 43% was retained by the Treasury for general purposes (table, above).

Getting back to the state level, however, many states have adopted antidiversion amendments in recent years, and oil men hope that others will be added in the next five years.

At present, 27 states have constitutional amendments. And eight others are considered possibilities (map). Utah is the brightest prospect, with a constitutional proposal to go before the voters next year.

Even with antidiversion amendments, however, some states have constitutionally diverted highway funds in recent years. But for the most part, these have been relatively small deviations. And, in many cases, the money was used for tourist promotion.

Three states—Nevada, West Virginia, and Hawaii—stand head and shoulders above all others. They have never diverted highway funds into nonhighway projects of any kind.

This could be considered near-remarkable for Nevada and West Virginia, considering the many diversion examples of their sister states. Since Hawaii did not enter the Union until 1960, it remains to be seen whether it will preserve its spotless record.

On the other hand, such states as New York, New Jersey, Rhode Island, Delaware, and Florida, are cited by highway-user groups as "horrible examples" of what shouldn't be done.

New York, for example, is credited with diverting more than $100-million in highway funds over the past several years, and more than $1.1-billion, all told, since 1925.

New Jersey, since 1925, has diverted around $500-million of its motor vehicle tax receipts. It has been estimated that, had this money been used for roads, the state could have built another New Jersey Turnpike System.

Resid Imports Up With Terminal Plan

Tentative import allocations for residual fuel on the East Coast for the 12 months starting Apr. 1 will average 442,892 b/d, an increase of 20,520 b/d over the level permitted in the calendar year 1960.

In addition to the allocations established for District 1, the Interior Dept. last week set a quota of 578 b/d to two importers in District 2—Great Northern Oil Co. (175 b/d), and Pure Oil Co. (403 b/d).

The final allocations for the next 12 months will be slightly higher than those now set.

Approximately 2% of the permissible imports will be held back pending certification of eligibility of some firms. Another 2% will be held in reserve for companies that qualify as terminal operators this year.

The change to a terminal input basis allowed 12 newcomers to become resid importers.

Company	Tentative allocations year starting Apr. 1	Allocations for year ended Dec. 31, 1960
	District 1, in b/d	
Ashland Oil	241	192
Atlantic Rfg	5,634	3,355
Ballard Oil	3,203	3,622
Belcher Oil	4,359	1,951
Canadian Natl Rys	22	25
Central Petroleum	3,359	3,749
Cities Service	1,829	—
Colonial Oil	4,089	4,624
Consolidation Coal	2,734	—
Deepwater Oil	2,071	—
Gulf	9,905	2,494
George Hall	550	439
Hess, Inc.	42,515	48,073
Inland Terminal	15	17
George T. Kaneb	28	32
Massena Oil Terminal	147	15
Metropolitan Pet	33,149	26,254
US M.P.S.A.	1,502	1,697
New England Pet	9,308	10,525
Northville Dock	1,350	—
Patchogue Oil	2,721	—
Preferred Oil	1,492	—
Pure Oil	2,487	499
Royal Petroleum	3,013	3,100
Sears Oil	1,351	—
Shell Oil	23,683	22,965
Signal Oil & Gas	8,268	8,783
Sinclair Oil	6,178	352
Socony Mobil	3,441	314
Southern States Oil	1,188	—
C. H. Sprague & Son	23,482	26,553
Standard of Calif.	3,344	785
Standard (Ind.)	23,681	26,777
Standard (Ky.)	12,086	13,666
Standard (N.J.)	113,812	128,695
Steuart Petroleum	4,259	4,817
Sun Oil	2,845	—
Texaco	60,366	68,259
Tidewater Oil	541	—
Union of Boston	2,926	—
Whale Oil	3,020	2,852
White Fuel	8,383	6,892
Wyatt, Inc.	4,315	—
Total	**442,892**	**422,372**

The Interior Dept. also granted two allocations in Districts 2-4 for the year starting Apr. 1: Great Northern Oil Co., 175 b/d; and Pure Oil Co., 403 b/d.

Wildcat Odds Are Getting Tougher

The odds against profitable wildcat discoveries are getting longer and longer with each year.

This is one of the many conclusions of the Committee on Statistics of Exploratory Drilling of the American Assn. of Petroleum Geologists in its latest report on exploratory drilling.

This particular finding is based on its continuing study of oil and gas fields having development histories of at least six years, and pertains only to "rank" wildcats—that is, discoveries that find new fields.

The over-all discovery odds are still the same, one in nine. But the success ratio of profitable wells has lengthened from an average of one in 43 to one in 45.

The odds in 1954—the latest year covered in the survey—were even longer, since the one-in-45 ratio is based on averages covering fields discovered during the 11-year period (1944-54) on which reserve estimates based on six years of development history are available.

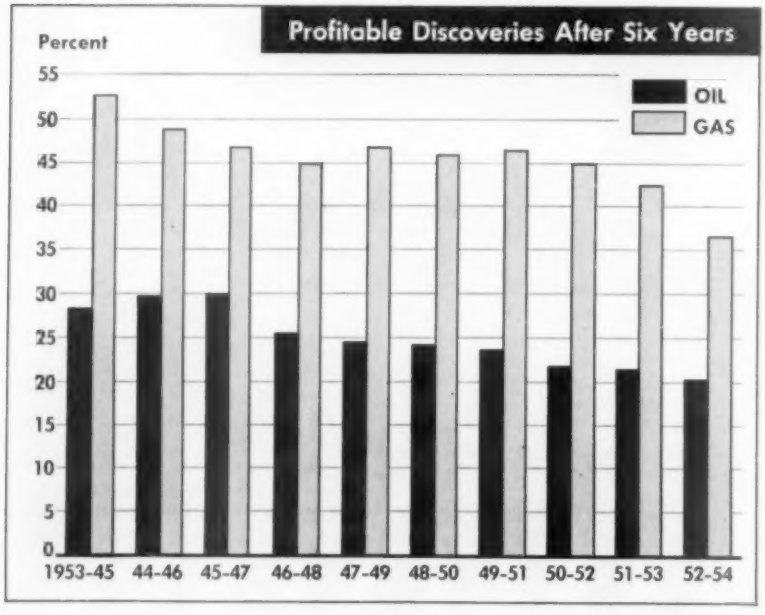
The study committee said the ratio in 1954 was one in 60—considerably worse than the 11-year average. In comparison, the 1944 ratio was one in 36.

The AAPG defines a profitable discovery as one that taps an oil field with an ultimate recovery potential of 1-million bbl., or a gas field with an ultimate recovery potential of 6-billion cu. ft.

The chart shows the percentages of discoveries, on a three-year moving average, that were profitable after six years of productive history.

The most significant conclusion that can be made, however, is that 98% of all new-field wildcats are failures, in that they are eventually abandoned, or discover reserves too small to be profitable, according to the study committee.

This, the committee held, "forcibly demonstrates the fairness of and the need for a depletion provision of at least 27½%."



Production in 16 States Exceeds Reserves Ratio

Production of liquid hydrocarbons in 16 of the 23 larger producing states exceeded the percentage relationship between each state's output and its share of the nation's proved reserves in 1960.

That is one of the findings of last week's report of the American Petroleum Institute's Committee on Petroleum Reserves.

The states whose ratio of production exceeded their ratio to reserves were Alabama, Arkansas, California, Colorado, Illinois, Indiana, Kansas, Kentucky, Michigan, Mississippi, Montana, Nebraska, New Mexico, Oklahoma, Utah, and Wyoming, as shown in the table below.

California, whose reserves have been declining for several years, is the largest producing state in the group of 16.

The state's reserves of liquid hydrocarbons last year declined by 115.4-million bbl., the largest for any state. Its ratio of production to the U.S. total was 11.5%, while its reserves amounted to 10.3% of the total.

Both percentages declined just slightly from 1959.

Oklahoma, whose reserves dropped 103.5-million bbl. last year, produced 7.5% of the liquid hydrocarbons, while it held 5.5% of the total reserves.

The seven states that produced at a lower ratio than their reserves indicate included the two largest oil states—Texas and Louisiana.

Texas had 47.8% of the reserves, unchanged from 1959, but its percentage of production last year declined to 38.7%, compared with 39.8% in 1959.

Louisiana's percentage position in both production and reserves showed increases last year. The state, with 16.2% of the reserves in 1960, produced 14.8% of the total liquids. In 1959 its reserves amounted to 15.7% of the total, and its production was 13.6%.

The other states producing at a ratio not in excess of reserve ratios were New York, North Dakota, Ohio, Pennsylvania, and West Virginia.

	Production		Proved Reserves		
	1960 (thous. bbl.)	Percent of U.S. total	1960 (thous. bbl.)	Percent of U.S. total	Years' Supply (based on '60 prod.)
Ala.	7,330	0.2%	33,305	0.1%	4.5
Ark.	28,045	1.0	329,494	0.9	11.7
Calif.*	332,478	11.5	3,972,403	10.3	11.9
Colo.	50,680	1.7	387,883	1.0	7.7
Ill.	79,226	2.7	565,979	1.5	7.1
Ind.	12,005	0.4	66,361	0.2	5.5
Kan.	120,136	4.1	1,082,252	2.8	9.0
Ky.	24,923	0.9	177,959	0.5	7.1
La.*	428,575	14.8	6,218,355	16.2	14.5
Mich.	16,107	0.6	79,441	0.2	4.9
Miss.	52,625	1.8	443,279	1.2	8.4
Mont.	30,908	1.1	278,375	0.7	9.0
Neb.	24,299	0.8	92,329	0.3	3.8
N.M.	132,616	4.6	1,568,457	4.1	11.8
N.Y.	1,814	0.1	32,383	0.1	17.9
N.D.	23,574	0.8	521,739	1.4	22.1
Ohio	5,050	0.2	74,677	0.2	14.8
Okla.	218,137	7.5	2,128,813	5.5	9.8
Pa.	6,009	0.2	109,742	0.3	18.2
Texas*	1,124,200	38.7	18,354,666	47.8	16.3
Utah	39,519	1.4	259,166	0.7	6.6
W.Va.	6,145	0.2	96,167	0.3	15.6
Wyo.	136,931	4.7	1,523,750	4.0	11.1
Misc.†	1,511	0.1	32,295	0.1	21.4
Totals	**2,902,843**		**38,429,270**		**13.2**

*Includes offshore reserves.

†Includes Alaska, Arizona, Florida, Missouri, South Dakota, Tennessee, Virginia, and Washington.

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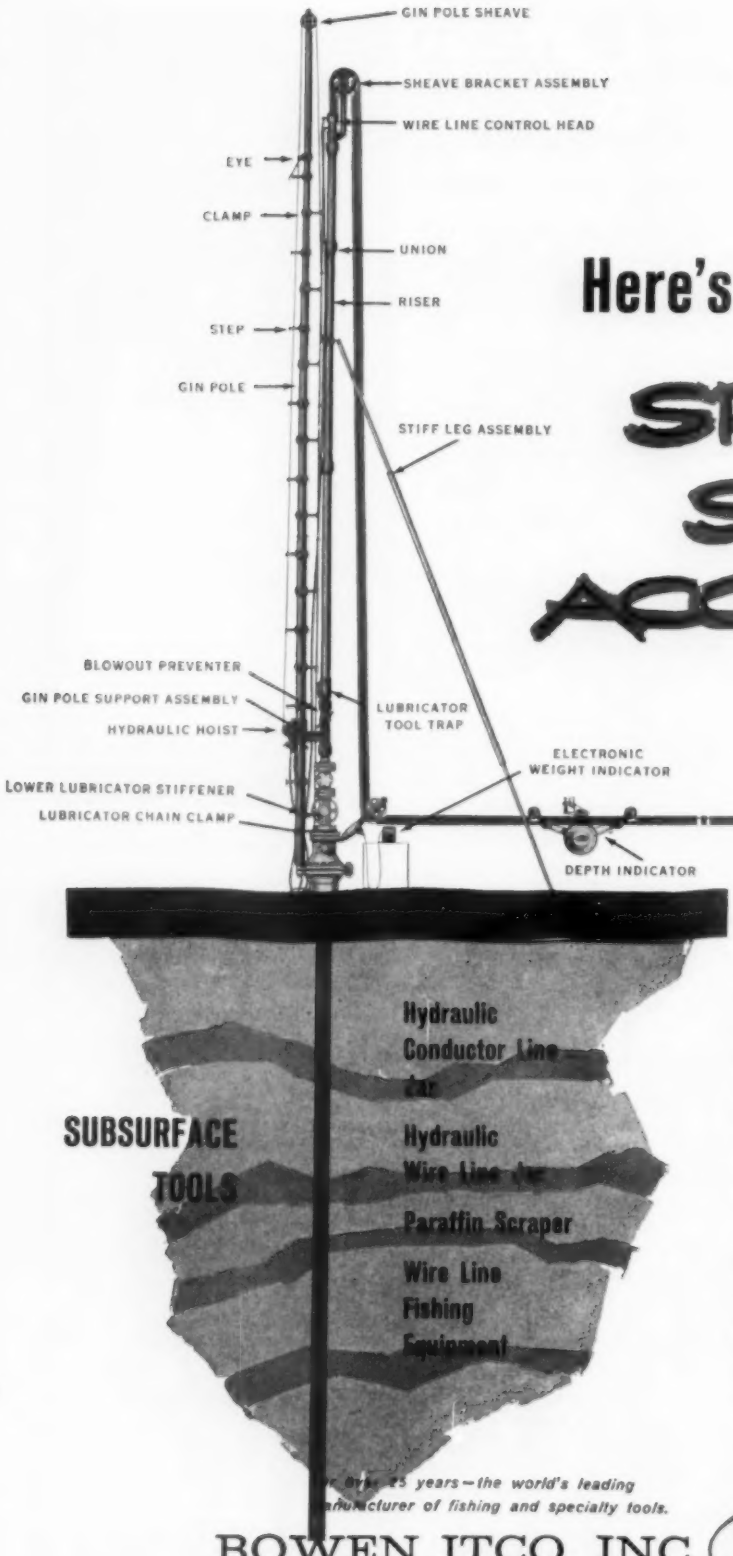

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The Export-Import Bank has decided to extend its credit backing to sales of oil field and refinery equipment by U.S. firms to foreign government-owned oil companies.

In a significant departure from previous Ex-Im Bank policy, Washington officials have decided to expand the types of credit assistance offered—and to include exports to oil companies which are wholly or partly owned by foreign governments.

Sales to such entities heretofore have not been eligible for Export-Import Bank assistance.

The policy change is expected to spur exports of oil equipment of almost all types.

Equipment manufacturers and supply firms had complained to the government that the earlier prohibition of Ex-Im Bank credit facilities was keeping the U.S. from multimillion-dollar export sales.

Most equipment sales are expected to fall into a medium-term credit category, covering transactions of six months to five years payment time following delivery.

The bank has not yet adopted any formula for determining what types of equipment will be entitled to specific lengths of credit time within the six-month-to-five-year span. Some guidelines will be established, probably holding to credit time limits normally used in international export trade.

But oil field and refinery equipment sold to national companies isn't expected to qualify for more than the five-year credit backing.

The Ex-Im Bank's credit facilities will cover equipment only—excluding oil company services.

Thus, no credits or guarantees, unless on a strictly commercial basis with private lenders, will be given for other exploration and development costs, for example. At present, the bank expects to include sale of such expendable items as drilling mud or cement, but not when part of a service.

Nor does the bank expect to back transactions involving payment of royalties on processes or systems owned by U.S. interests, unless payment is made in a lump sum as part of an export transaction.

With the way cleared for Ex-Im Bank help, U.S. equipment manufacturers now can get several different types of export assistance.

On all medium-term transactions, Ex-Im Bank requires 20% of the export's invoice value to be paid by the buyer at delivery time. The bank participates in the balance, or "financed portion." Customarily, this financed portion is repayable in semiannual, quarterly, or monthly installments.

Ex-Im Bank medium-term assistance includes:

• **Medium-term political risk guarantees:** Exporters can arrange for this coverage through the bank, which issues contracts on an individual case basis. The coverage includes guarantees against five types of noncommercial hazards—nonconvertibility of foreign currencies, imposition of laws which prevent delivery of goods, cancellation of import licenses, war or rebellion, and expropriation. The fee: 0.75% a year on outstanding balances.

• **Comprehensive guarantees:** Exporter can get comprehensive coverage for both credit and political risks from Ex-Im on a case-by-case basis. This covers risks by the exporter or his bank to the extent of 85% of the financed portion of the transaction. The fee, payable in advance, is 1.5% annually on the declining balances.

• **Exporter credit:** Where direct financing by Ex-Im Bank is wanted, the bank participates with the exporter on a case-by-case basis by buying from him, in cash and without recourse on the exporter, the buyer's obligations for 85% of the financed portion of the transaction.

The exporter also will have Ex-Im help in financing through U.S. commercial banks.

Ex-Im takes part in financing medium-term transactions by relying solely on a commercial bank's credit judgment in several circumstances:

• If a commercial bank is ready to finance the first three semiannual installments of a credit which matures in three years or less, Ex-Im will finance the remaining installments without participation by the exporter. The commercial bank's portion of the financing must be on its own account.

• If a commercial bank finances four semiannual installments on a credit of from three to five years, Ex-Im will finance the remaining payments, again without the exporter taking part.

• If both an exporter and a commercial bank take part in each of the installments—the exporter up to 15% of invoice value and the bank to 10%—Ex-Im will finance 55%.

Exporters also are expected to benefit from a new program Ex-Im Bank is now undertaking to provide more medium-term credit from private banks, perhaps through a new private corporation or group of banks.

NEXT WEEK *Be Sure to Read:*

EVOP CAN HELP processors . . .

EvOp—evolutionary operation—is a technique that is being adopted in processing plants. It is based on the theory of natural evolution. A small, almost unnoticeable change in a process may bring about an improvement.

EARNINGS PATTERNS are changing . . .

Significant changes have occurred in the earnings trend of the leading oil companies in the past 30 years.

Night Survey in the Gulf

Shell Team Pinpoints Offshore Test Sites With Rocket Flares

Rocket flares suspended momentarily in darkened skies have enabled Shell Oil Co. teams to pinpoint offshore test sites far beyond the horizon with a preciseness unmatched by orthodox surveying techniques.

Flares and night surveys are not uncommon in the oil industry—but what makes this approach different is that this is the first time that rockets have been used to carry the flares high into the heavens.

The flares, suspended on parachutes, helped Shell surveyors to overcome a basic problem—the curvature of the earth, which limits visual sightings and affects radio location systems as well.

Visual sightings in the Gulf area usually are limited to about 7 mi. And because radio waves travel in straight lines, it was felt that these systems were not sufficiently accurate for test sites 30 mi. and more out in the watery wastes.

Shell used three teams (map), and the readings were computed on an IBM machine. The findings showed a difference of 120 ft. from radio location surveys—not much, in one sense, but enough to miss a borderline target.

1 STANDBY instructions are radioed by W. T. Harless from the Sea Wolf, 31 mi. out in the Gulf from Galveston.

2 FIRE, comes the radio command, and surveyor P. M. Walters pulls the trigger of a specially designed flare.

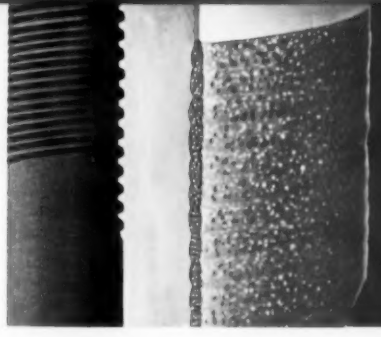
3 HIGH IN THE SKY, the parachute flare drifts down, providing a perfect target for tracking teams and observers.

4 INSTRUMENT CHECKS are made in advance by surveyors R. E. Collins and C. W. Fisher.

5 PINPOINT ACCURACY is assured by three teams, which triangulated their findings from Oster, Buccaneer, and Platform observation posts.

Inarclad 60

the newest, longest-wearing hard banding



a full
3 inches
on every
standard
application

REED

Reed is proud to announce the newest, most effective method of hard banding tool joints. This new process, "INARCLAD-60," is the result of Reed's accelerated research program. This program entailed several years of research and major expenditures for capital equipment. New production facilities control the entire process from pure tungsten to the INARCLAD-60 applied on the tool joint.

Reed's research in the laboratory and in the field has developed the optimum hard banding for more abrasive resistance and therefore longer tool joint life. Reed now offers, as standard tool joint hard banding, three different applications of tungsten carbide, each of which covers a full three inches on the joint.

For complete details, call your local Reed man or write — REED ROLLER BIT COMPANY, P. O. BOX 2119, HOUSTON 1, TEXAS.

Texaco in Trinidad is a big investment in the development of oil—and individuals. A visitor to this lovely, lively island will see thousands of Trinidadians at work where once such opportunity did not exist. He will see boys, 16 to 20, enrolled in Texaco training courses, continuing as on-the-job-with-pay apprentices. Students showing unusual aptitudes are awarded Texaco scholarships for university study. For all, it is a dream of success and security come true. Texaco in Trinidad is creating new futures for the people, sound growth for the economy of the island.

TEXACO: SYMBOL OF WORLD-WIDE PROGRESS THROUGH PETROLEUM

a christmas tree is only as strong as its weakest seal

Rector makes the hook-up that is Sealed with Steel throughout

Rector wellhead equipment is designed to insure a leak-proof seal at all connections. Compare Rector's metal-to-metal seal features with any equipment on the market using resilient packing between casing and tubing strings. The Rector principle of reinforcing temporary organic packing with a permanent ring of steel insures a positive leak-proof completion every time. Rector's built-in welding ring coupled with an API ring gasket is easy to install, immune to corrosion inhibitors, will not flow under high pressure or temperature, will not freeze or contract under low temperature, will not burn out, and never requires maintenance or replacement.

There are no weak links in your completions, when you specify Rector equipment at your favorite supply store, or from your Rector representative.

30 YEARS MAKING THE OIL INDUSTRY SAFER

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Number 3 of a Series
TELL THIS PETROLEUM INDUSTRY FACT TO YOUR NEIGHBOR

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The petrochemical industry processes oil and gas hydrocarbons into raw materials for fibers, drugs, chemicals and plastics. Petro-chemistry transforms gas liquids from field processing, refinery light ends, "off-gas" and many other petroleum by-products into thousands of wondrous new materials. In our free enterprise climate the petroleum industry invests millions of dollars annually in research and development to put the squeeze to oil and gas that constantly widens the horizon of end uses for these hydrocarbons.

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6102

What's New IN THE INDUSTRY

Humble Oil & Refining Co. expanded its holdings in Ohio this week by acquiring 12 Sun Flash Oil Co. service stations in six cities. Financial terms were not disclosed by either company.

Humble inaugurated its Ohio service station development program last April, but has been actively marketing in the state less than seven months. Prior to the Sun Flash deal, it had about a dozen stations, with 25 more under construction.

•

Mecom's deep test in Plaquemines Parish, La., may have encountered "a good commercial oil sand" between 16,000 ft. and 17,000 ft. The operator is continuing to drill, and early this week had pushed beyond the 18,000-ft. level.

•

Canadian production of liquid hydrocarbons may reach 600,000 b/d in April, giving rise to hope that the national oil policy goals of 625,000 b/d by July, and 640,000 b/d by the end of the year may be attained.

Oil and government men in Ottawa say more Canadian crude will move into the Puget Sound area soon, and more is already moving to refineries in Toronto. Texaco Inc. is reportedly stepping up the use of Canadian crude in its Anacortes (Wash.) refinery from 16,000 b/d to 40,000 b/d.

Trade Minister George Hees meanwhile told the Canadian Petroleum Assn. at Calgary that he is "encouraged" by National Energy Board reports on the brighter prospects for 1961.

•

Continental Oil Co. is joining with Pauley Pan American Petroleum Co. in the exploration and development of Mexican tideland areas in the bay of Campeche.

Pauley is operating in the area under a 1949 contract with Pemex. The Santa Ana field being developed by the former has eight wells producing a total of more than 5,000 b/d.

•

Oklahoma and Kansas have cut their crude allowables for April. The Oklahoma Corporation Commission trimmed its basic allowable from 19 b/d to 17 b/d, and the Kansas Corporation Commission set its April allowable at 305,000 b/d, down 10,000 b/d from March.

•

Lone Star Steel Co. is stepping up production in two more departments of its E. B. Germany works in East Texas. The rod mill is adding a second shift, and the cast iron pipe foundry is moving up from four to five days a week. Within the past six weeks, callbacks have returned 1,200 employees to the payroll, leaving only 600 in layoff.

•

Allowable reductions in 1960 cost Texas 50-million bbl. of its share of the domestic market, according to John G. Hurd, president of Texas Independent Producers & Royalty Owners Assn.

Hurd told the North Texas Oil & Gas Assn. that other producing states gained some 40-million bbl. of the domestic market, and that imports accounted for another 15-million bbl.

Lewis H. Bond, president of the Fort Worth National Bank, told the group that if business picks up generally, as is expected, the outlook for oil financing is "good."

•

Stockholders of Merit Oil, Ltd., have approved the sale of most of the firm's assets to Canadian Husky Oil, Ltd. The sale includes accounts and notes worth $1.7-million, Merit's interests in four oil wells, certain leases and royalties, and all of the issued shares of Provincial Products Pipelines, Ltd.

•

Shell Oil Co. has purchased the producing properties of Western Natural Gas Co. in the Whitlash field in Toole County, Mont., for a reported price of $820,760. The holdings include 29 ore and gas wells.

•

Monroe E. Spaght, president of Shell Oil Co., and Earl Ellerbrake, of the Interior Dept.'s Office of Oil & Gas, are chairman and co-chairman, respectively, of the National Petroleum Council's Committee on Oil & Gas Transportation Facilities. Membership of the committee was announced by NPC Chairman Walter Hallanan.

Looking Ahead in Washington

McGraw-Hill
Washington Bureau

March 31, 1961

Action on a national fuels study seems to have shifted from the House to the Senate. House leaders won't discuss when a vote might come on a fuels study resolution already cleared for floor action. Senate sources say without qualification that the House leadership has dropped the idea, and will leave the study to a special Senate committee.

This change would be a victory for coal interests. They first sought a joint study by a House-Senate committee. Speaker Sam Rayburn blocked that, and appeared ready to push a separate House study. Coal spokesmen would now prefer a Senate study, and if Rayburn takes no further action, they seem likely to get it.

•

Kennedy Administration problems with the Federal Power Commission chairmanship may be resolved by Rep. Oren Harris (D., Ark.). Harris has proposed a bill to raise FPC from five to seven members, increase terms from five to seven years, and give Kennedy the power to name the chairman.

Harris' proposed bill would clear the way for Joseph C. Swidler to replace Jerome K. Kuykendall as FPC chairman before Kuykendall's term on the commission expires in June, 1962. If the bill succeeds, Harris would certainly have a voice in naming the two extra commissioners. This may silence some complaints that Swidler is too liberal, as well as charges that Swidler and Howard Morgan, Kennedy's other FPC nominee, don't know enough about natural gas.

•

The Federal Trade Commission's sweeping investigation of old anti-trust cases will involve some oil companies. But government lawyers won't specify which ones. The inquiry will check on compliance with 56 major judgments and consent decrees in various industries over the past 20 years. The list of cases sent by Attorney General Robert F. Kennedy to FTC Chairman Paul Rand Dixon was taken from more than 1,000 possibilities.

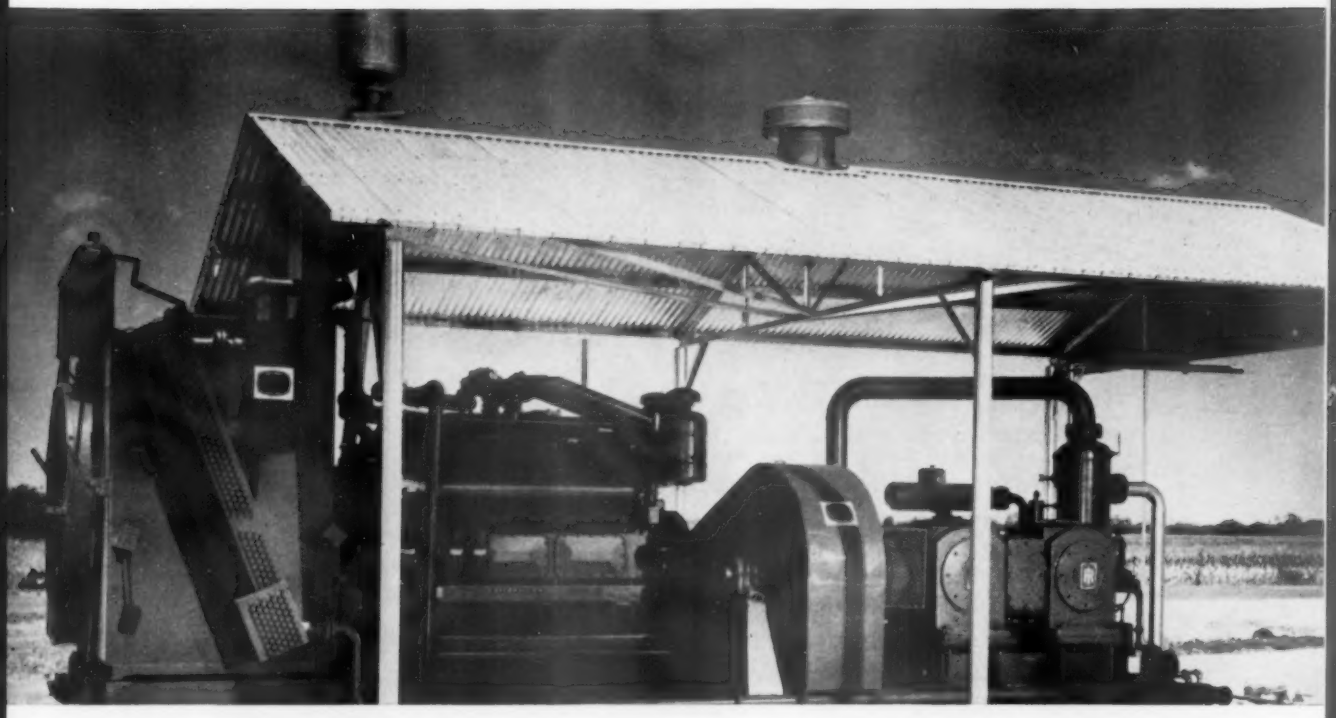
More attention to compliance with Justice Dept. and FTC orders is likely to be a permanent outcome of the investigation. For one thing, FTC probably will wind up with a bigger staff. FTC aides began to complain as soon as the probe was announced that they couldn't make the check in a reasonable time.

•

The American Petroleum Institute reported by far the highest lobbying expenses for any organization registered with Congress. API listed expenses for the final quarter of 1960 of $63,416, more than double the next-ranking organization. These costs were unusually high because they included some $50,000 spent on mailings in the campaign against increased gasoline taxes. For the three previous quarters, API reported a total of $28,000, making its lobbying expenses for the year $91,420. The National Coal Policy Conference has never registered as an organization under the lobbying laws. A member of the NCPC staff, Louis H. Renfrow, is registered as an individual lobbyist for NCPC.

engine power
BY CATERPILLAR

Gathering station for five natural gas wells on J. M. Dellinger's Aqua Duce, Texas, ranch is powered by Cat G397 Natural Gas Engine with Ingersoll-Rand two-stage compressor. Engine operates 24 hours a day, seven days a week, pumping 2,700,000 cu. ft. a day.



We asked J. M. Dellinger why he specified a Cat G397 for his Aqua Duce, Texas, gathering station

"It not only gives maximum production at the lowest operating cost, but when the time comes to trade or dispose of Caterpillar Engines, they have a much higher trade-in or market value than any other machinery of their type. The availability of parts and service through a fine dealer organization is a great factor in making Caterpillar Engines profitable to own and to operate. With a large natural gas supply on my ranch, it became necessary to install a gas compressor. When I learned that Caterpillar Natural Gas Engines were available, I insisted that the Model G397 be installed with an Ingersoll-Rand Compressor. This was even though I had tentatively ordered another engine brand."

Businessmen, like Mr. Dellinger, buy on business logic. They don't change their minds on whim—but when a better choice comes along, they recognize it and act. That's just what Mr. Dellinger did.

Cat Natural Gas Engines yield high continuous horsepower at extremely low cost. Maintenance costs are low. Cat Natural Gas Engines need no derating for continuous operation. Two compression ratios are available for use with a wide variety of gaseous fuels. They are available with 6, 8 or 12 cylinders, naturally aspirated or turbocharged and aftercooled, with continuous output ratings to 725 HP.

For complete information on Cat Natural Gas Engines see your Caterpillar Dealer or your machinery supplier early in your planning. He'll be able to save you money on initial investment and on operating costs.

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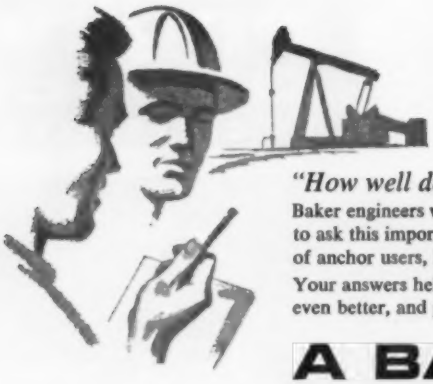
Engine Division, Caterpillar Tractor Co., Peoria, Ill., U.S.A.



"How well does it work?"

Baker engineers went out into the field to ask this important question of dozens of anchor users, large and small.

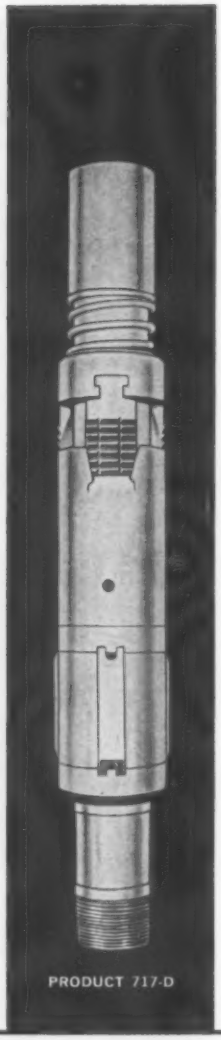
Your answers helped us to make a good tool even better, and proved again that . . .

A BAKER COMPENSATING TUBING ANCHOR

Reduces Rod and Tubing Wear as evidenced by the need for fewer pulling jobs.

Increases Pumping Efficiency as measured in more barrels of oil, reduced pumping speeds or lower power consumption.

Really Does Compensate as indicated by the need to respace pumps after several days use, or by the upstrain required to release doughnut-type hangers—or, most importantly, by the results obtained.



PRODUCT 717-D

The Baker Compensating Tubing Anchor has been on the market a little over three years. It has proved its ability in hundreds of wells and recent changes make it even better.

Because it automatically compensates for changing well conditions, it maintains the right amount of tension at all times to effectively eliminate breathing and buckling. It's easy to run—no involved calculations, no need to apply tension from the surface.

A careful study of hundreds of field reports reveals not one reported instance of inability to retrieve a Baker Compensating Anchor where the casing above the anchor was in good condition and to gauge. And recent design improvements now insure easier removal with greater freedom from corrosion.

The economics of today's oil industry make it more important than ever to explore every possible means of cutting costs and improving efficiency. Baker honestly believes that the Compensating Tubing Anchor is one such means. Your Baker Man has the facts on this tool's past performance, and on the several ways it has been improved. Ask him.

TYPICAL FIELD REPORTS

Kansas: Operator ran anchor in an attempt to cut down tubing leaks (seven leaks in previous three months). In the twelve-month period following installation of a Baker Compensating Tubing Anchor he has had only two tubing leaks and has increased pump efficiency by approximately 43%.

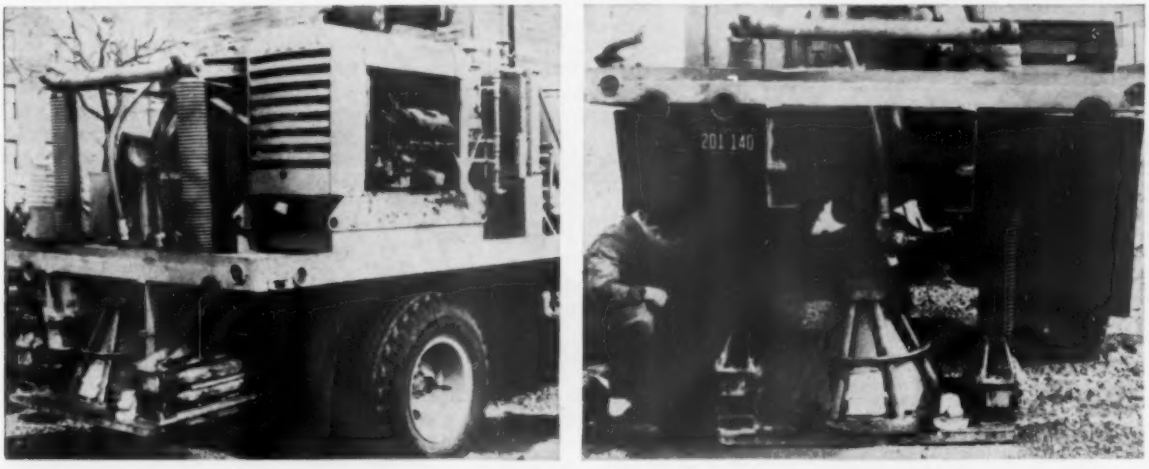
Texas: Operator had run twenty-five Baker Compensating Tubing Anchors and was very pleased with results. As a test, he released the Baker anchor in a well that was making 140 barrels per day. After release (tubing string unanchored) he reported that production fell off to 75 barrels per day. After resetting anchor, production went back to 140 barrels per day.

Eastern Colorado: Operator has run 40 Baker Compensating Anchors. Had not previously used anchors. Ran anchors to reduce frequency of tubing jobs to replace rod-cut tubing. Reported that he had eliminated rod-cut tubing, increased pump life 100% and production 14%.

BAKER

BAKER

BAKER OIL TOOLS, INC. HOUSTON • LOS ANGELES • NEW YORK



VIBRATOR test unit is shown mounted on truck (left). Steel weight, lowered to ground (right) vibrates on signal. Now, the . . .

Vibroseis Is Readied for General Use

A seismic system that permits control of introduced energy signals has been added to the oil industry's geophysical tool chest.

Known as the Vibroseis, the system was developed through the joint efforts of Continental Oil Co. research and exploration personnel. Until recently, it had been used exclusively by that company as an important adjunct to its domestic exploratory activities.

The system now has been licensed to Seismograph Service Corp., which plans to make it available for general industry use as rapidly as equipment can be manufactured in its Tulsa laboratories (PW—Feb.17'61,p34).

Says Bill Heap, manager of SSC's newly organized Vibroseis department: "Training of personnel is well under way, and the company already has its first fully equipped crew in the field."

A prototype of the surface vibrator system was devised by Conoco several years ago, but the version licensed by SSC differs from the original in several important respects. These include means of producing a repeatable energy "sweep," and the use of several energy sources simultaneously.

In most applications, the revised system has given superior record quality. And in some areas, notably the east flank of the Delaware Basin, good results were obtained on lines that completely thwarted previously tried conventional seismic efforts.

Heart of the new system is a truck-mounted servo-hydraulic vibrator unit actuated by a master control signal transmitted via radio from the recording unit.

Use of the master control signal permits operation of any number of vibrator units simultaneously with precise in-phase matching.

Though any number of vibrator units may be operated simultaneously to provide the required energy, experience has shown that two or three units generally achieved desired results.

Actual synchronization of the vibrators is accomplished by electronically controlling a servo-hydraulic valve in such manner as to insure that an actuating piston exactly follows the control signal.

In effect, a sinusoidal (wave) electronic control signal is converted to the simple harmonic mechanical motion of an hydraulic piston.

A 2,000-lb. steel weight, referred to as the reaction mass, is attached to the hydraulic piston in order to utilize the force developed hydraulically. The entire assembly is "coupled" to the earth by the weight of the truck through what is termed the base plate.

In this manner, the base plate, and through it the earth upon which it rests, is caused to vibrate with the control signal. The action can be described as a "flat force" system; that is, one having constant acceleration, mass, and force over a given frequency band.

The master control signal is derived from a magnetic tape in the recording unit. Different tapes are required to produce different frequency spectrums and sweep times.

Sweep time—defined as the length of time required to transmit the full frequency spectrum being utilized—can be varied. As a matter of practice, however, usual duration is from five to seven seconds.

Sweeps usually are repeated automatically at 12-second intervals, or multiples of this time period. They may, however, be initiated when desired by the observer in the recording unit.

Frequency spectrum used may include the whole useful seismic range or any portion thereof. Normally, a range of 15 cycles to 90 cycles per second covers the frequency spectrum that is employed in seismic exploration.

This feature of the Vibroseis, explains Heap, "is a valuable contribution to seismic exploration because it permits introduction into the earth of that portion of the frequency spectrum which will be most useful.

"Because the system permits this control over the input signal to the earth, it is possible to adjust the frequency spectrum to utilize the energy expended at the source more fully, while eliminating undesirable frequencies not useful to the problem at hand."

Field application of the Vibroseis differs considerably from conventional seismic shooting. Two basic methods are employed.

Standard in-line profiling is accom-

plished by laying out two continguous geophone spreads, one on either side of a centrally located vibrator pattern.

Quarter-mile spreads normally are used, but this distance may be varied in accordance with local conditions.

Nearest geophones to the vibrator pattern are offset a minimum of 800 ft., and are usually offset a full spread length. The vibrators operate on an in-line pattern over a distance of several hundred feet.

Each spread length contains ten detector systems, giving a total of 20 channels, or traces, represented on each record. The recording unit is usually set up at one of the geophone spreads, with data from the other spread usually transmitted via conventional geophone jumper cable (metallic circuit).

The second method, referred to as "transposed in-line profiling," is used when additional geophone stations are required to obtain adequate signal strength.

This method entails the use of two geophone nests fed into two seismic channels. A hundred or more geophones may be contained in each nest.

Vibrator units operate in unison over ten separate patterns covering a spread length between the nests. These patterns generally are 400 ft. to 600 ft. square.

In effect, the relative positions of the geophones and the vibrator are interchanged from the standard in-line profiling setup.

The recording unit is located at one of the geophone nests and the composited signal from the far geophone nest transmitted via radio to the recording unit.

Reflected energy is recorded by special narrow heads on magnetic tape.

Since each narrow head is one-tenth the width of the transcribing heads, the system permits transcription of ten tracks simultaneously. This automatically composites ten individual tracks into one track and stores ten times more information on one tape prior to transcription.

Correlation of recorded energy with the master input signal is accomplished by an electronic computer at the field office.

Computer processing is necessitated by the fact that recording of reflected seismic signals begins while energy still is being introduced. Cross-correlation with the master signal is required to obtain meaningful data.

Through the process of computer-correlation, actual travel times of reflected energy are obtained, and the effect of stray noise is reduced to a minimum.

This is true because extraneous signals, such as wind noise, do not correspond to the assigned sweep signal, and thus are rejected in the computation process.

Magnetic tapes obtained by a field crew during a normal shooting day can be correlated by computer in less than one man-day, providing rapid processing of field data.

Additionally, data feedout is provided in the form of conventional magnetic tapes or paper records.

By going from the magnetic tape feedout to a central playback system, it is possible to obtain conventional galvo (wiggle-trace), variable density, variable area, or galvo-density corrected cross sections.

Operators 'Rediscover' New Mexico Pay

A Southeastern New Mexico area once regarded as unimportant is the scene of one of today's busiest and most successful Permian Basin drilling campaigns.

Some 30 rigs are being kept active in a 10-mi. by 15-mi. arc in southern Roosevelt County and northern Lea County. Only five were running last October.

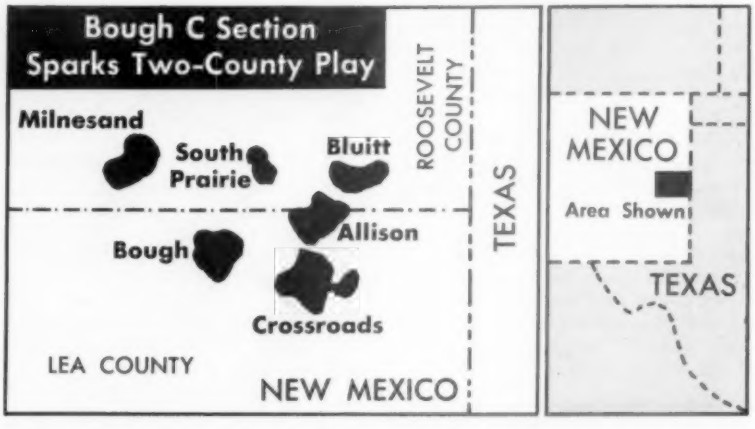
Target of the drilling is a relatively thin (15-ft.) Permo-Pennsylvanian section called Bough C. The C level, one of four in the Bough, is found at approximately 9,600 ft.

There are five Permo-Pennsylvanian pay areas surrounding the South Prairie pool in the center of the arc. Other areas are Milnesand, Bough, Crossroads, Allison, and Bluitt.

The Bough C was discovered in 1949 but was disregarded.

Operators were more interested in the deeper and more promising Devonian production than they were in the Bough C, which they thought was too thin. (Devonian pay was 600-ft. thick at 12,000 ft.)

As one operator explained: "When you drill 10,000 ft. and below, you're usually looking for something big in order to pay out drilling costs . . . We certainly weren't drilling that deep in search of Bough alone."



Some Bough C and Devonian dual completions were made, but little attention was paid to the Bough except for such dual completions.

Renewed interest in the Bough C developed three years ago when many of the Devonian wells began to turn to water.

The first prod to activity came when Ohio Oil Co. opened the Bluitt pool with its No. 1 Federal-McGrail in January, 1959. The well flowed 720 b/d.

Bough C activity really came to life when the South Prairie pool was opened last October in Roosevelt County.

Cosden Petroleum Corp.'s discovery, on a farmout from Socony Mobil Oil Co., opened the South Prairie pool and caused a soaring of Bough C interest outside the immediate Bluitt area. Cosden's No. 1-C Federal, Section 20-8s-36e, 4 mi. west of Bluitt pool, was completed for 1,128 b/d of 47-gravity oil through 28/64-in. choke and perforations at 9,653-72 ft.

The number of rigs drilling in Roosevelt County jumped from two last October to 17 today. One operator reported obtainable working in-

terests in new Bough projects, originally ranging approximately 75%, were now between 45% and 50%.

Operators like the area because drilling is fast, payout is quick, most wells have a big, high-pressure flow, and the dry-hole ratio is low.

One operator calculated spudding to completion took 42 days. A survey of most of the wells shows completion took four to six weeks.

Drilling costs average in the neighborhood of $150,000 per Bough well. At the current ratio, there are eight paying wells and two dry holes in every ten tries.

Current number of Bough producers by fields: Milnesand 15, Bough 9, Allison 62, Bluitt 28, and South Prairie 8.

Average initial production has ranged between 400 b/d and 500 b/d for wells in most portions of the Bough area. Gas-oil ratios have been 2,000-1 in a majority of the wells.

Geologists admit the Bough zone is ill-defined and operators call it a hit-or-miss operation. But the potential payoff makes the risks worthwhile, most operators feel.

One geologist says: "You can drill with expectations of landing a 900-b/d producer if you hit the porous section just right. But if you miss it, you've got a hole full of salt water."

Most geologists agree the Bough is a uniform, blanket pay, partly structural (anticlinal) but dominantly a stratigraphic trap. The limestone pays of the Bough section are in four levels, designated A, B, C, and D. The C has proved the most prolific.

In the Milnesand pool to the west, the pay is from the B and C zones, and there is some indication of oil production from the A zone at 9,150-9,238 ft. The central areas, South Prairie and Bough, produce from the C at approximately 9,650 ft. Eastern production in the Bluitt Bough C pool is from 9,500 ft.

The inconsistence of vertical sections is explained by random pinching-out or shaling-up of limestone stringers. The Bough sections are intermingled with red, green, and gray shale stringers and the entire zone is bounded on top by Wolfcamp and on the bottom by Cisco shales. Lithology of the Bough is a light-colored (white-to-tan) fossiliferous fractured limestone.

Wells in some areas are producing from solution-gas drive and in others from water drive alone. The drives are combined in some areas. Most engineers agree the uniform vuggy-fractured nature of the formation has contributed to large and easy-flowing wells.

Development has not yet been extensive enough for an accurate estimate of reserves. One operator says, "Reserves have to be made on a well-to-well basis" because of the discontinuity in the pay for wells in a single area.

Twelve Permo-Pennsylvanian wells in the Bough area averaged 230,000 bbl. of oil each before going to salt water. There is no regular spacing in the Bough area. Each well drains approximately 80 acres.

In the Allison pool, one major company estimates reserves as 120,000 bbl. per well.

Operators active in the area, in addition to Ohio and Cosden, include Lone Star Producing Co., Shell Oil Co., Atlantic Refining Co., Tennessee Gas Transmission Co., James G. Brown & Associates, Coastal States Gas Producing Co., Socony Mobil Oil Co., David Fasken, Bill Roden, J. C. Williamson, and Yates Drilling Co.

The Bough oil production is currently handled solely by McWood Corp.'s Midland gathering system, which ties into Magnolia Pipeline Co.'s transmission system in the Allison area.

GEOLOGISTS...
GEOPHYSICISTS

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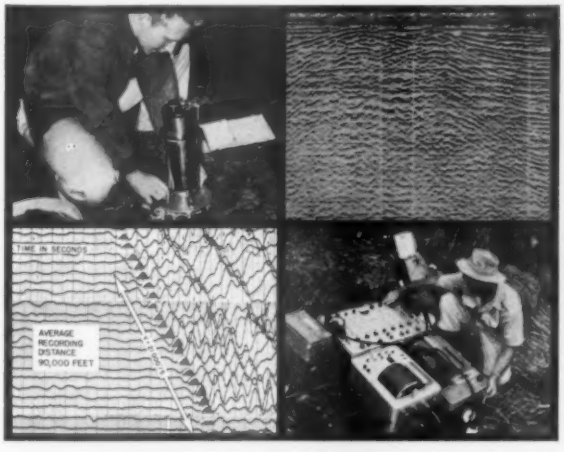

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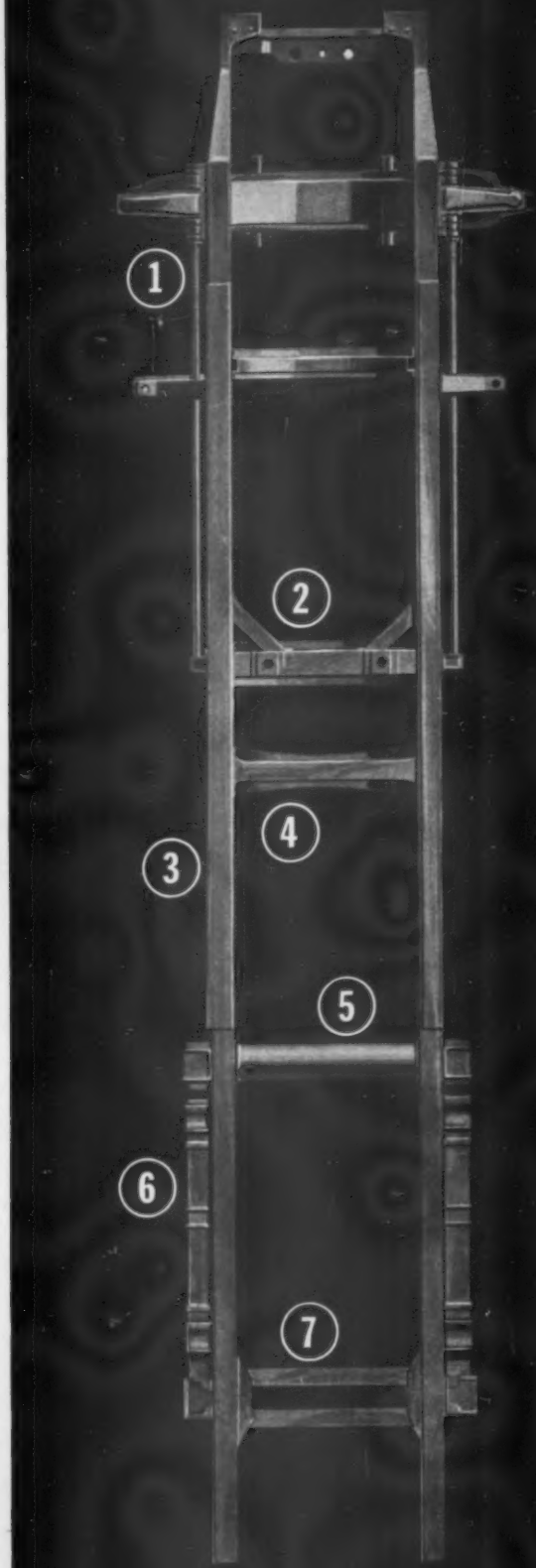
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NEW SUPER-TOUGH ANSWER FOR TRUCK-KILLING JOBS!

HERE'S BONUS BACKBONE BRAWN—CHEVY TRUCKS SPECIALLY EQUIPPED FOR EXTRA-SEVERE DUTY!

They're built to blaze trails lesser trucks can't travel—to bull their way through brutal back country with king-sized loads—to stand up to terrain that can turn ordinary trucks into scrap iron before their time. Chevrolet's new heavy-duty off-highway chassis equipment option is good news for off-road operators everywhere. Now you can get the profit-protecting advantages of years-ahead Independent Front Suspension ride combined with the extra chassis beef your kind of work demands. The tougher your task, the more you'll appreciate the strength and durability built into this one!

■ **EXTRA BEEF FOR BRUTAL DUTY:** That beaver emblem on the sides of Chevrolet's new extra-duty-equipped medium- and heavy-duty trucks will be showing up more and more where the jobs are toughest—where getting the work done demands performance beyond the normal call of duty. These Chevies look the same on the outside, but there's a big difference down deep. More than just an add-on or build-up package, Chevrolet's new off-road equipment option combines maximum-duty suspension components with a special-built frame that's engineered for all-out ruggedness in every detail. A frame with K-braced ladder-type construction that delivers extra torsional resilience to soak up brutal beatings.

Here's what you get: ❶ Heavy-duty 4,000-lb. torsion bars up front, anchored right at the frame K-brace crossmember for sturdy support. (Anchors are truss-rod-connected under the frame for an extra margin of strength.) ❷ Massive K-brace crossmember between the torsion bar anchors, specially designed for maximum structural rigidity and fabricated of high-tensile-strength steel. ❸ Extra-heavy side rails, of full quarter-inch stock, with full-length L-plate reinforcements. ❹ Heavy-gauge alligator-jaw crossmembers in frame midsection that combine high strength with give-and-take resilience. ❺ A massive tubular crossmember, anchored in extra-heavy cast steel brackets at the rear spring front hangers. ❻ Maximum-duty 11,500-lb. rear springs of standard variable-rate design, plus the extra margin of 2,000-lb. auxiliary springs. And ❼ a massive double channel crossmember at the spring rear hangers heavily gusseted fore and aft—the finishing touch of rock-ribbed ruggedness between roughest roads and heaviest loads.

If yours is a truck-killing job, this new option is tailor-made for you. You can get it on any of four medium- and heavy-duty models to match your needs best, and you'll be surprised at how little it costs. See your Chevrolet dealer right away for full details. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

Availability: Heavy-Duty Off-Road Chassis Equipment

Model	Wheelbase	Cab-to-Axle	Max. GVW	Front Suspension Capacity	Rear Axle Capacity
C6303	157″	84″	19,500 lbs.	5,000 lbs.	15,000 lbs.
C6503	175″	102″	19,500 lbs.	5,000 lbs.	15,000 lbs.
C7303	157″	84″	23,000 lbs.	7,000 lbs.	16,000 lbs.
C7503	175″	102″	23,000 lbs.	7,000 lbs.	16,000 lbs.

1961 CHEVROLET STURDI-BILT TRUCKS

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SPECIAL REPORT TO MANAGEMENT

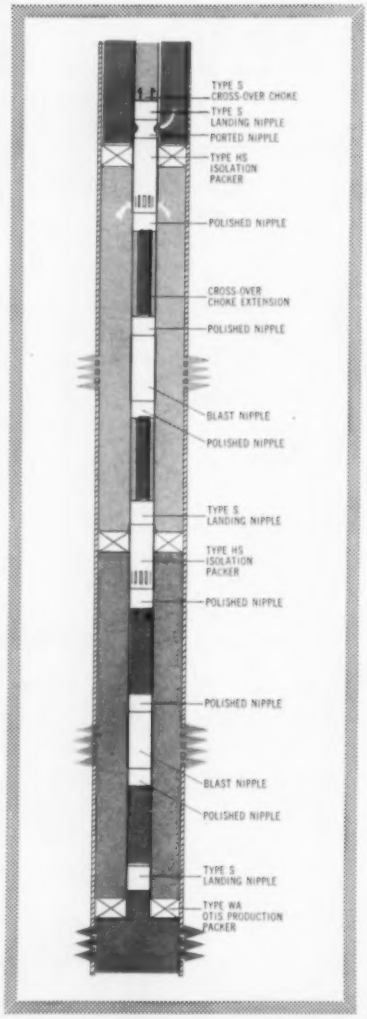
OTIS PRODUCTION NEWS

Volume II, Number 4 **Otis Engineering Corporation • Dallas** *Production Equipment and Services*

Otis Triple Zone Selective Cross-Over Completion Designed to Permit Production of Any Two Zones—Postpone Remedial Work

CORPUS CHRISTI—Operators in this area have found a new Otis Selective Cross-Over Completion ideal for producing new triple zone wells. The completion offers its greatest savings through selectivity of production, and is designed to postpone remedial operations which would entail moving a rig back over the hole. The completion is also designed to be made in standard 5½" casing using 2⅜" tubing to aid in holding downhole equipment costs to a minimum. This new Otis triple zone completion is designed to permit any one of the three zones to be produced individually with the other two blanked off, or two of the three zones to be produced simultaneously, directing the production from either zone through the annulus or the tubing as desired. When producing two of the zones simultaneously, one of the zones must be crossed-over just above the top packer through the use of a standard Otis Concentric Cross-Over Choke.

In addition to the above, this type of cross-over completion offers several other production advantages. The completion technique employed on initial installation is designed to permit each packer to be tested to the breakdown pressure of the zones before the next packer is set. Access to the upper zones is through the ports in the Sliding Side-Door® assembly of the Type HS Otis Retrievable Isolation Packer. Type HS Packers are used to isolate the upper two zones as shown in the accompanying installation diagram. In this installation, by straddling the upper zone with the top two packers, a short extension to the Otis Straight Flow or Cross-Over Choke acts to permit selective production of the middle and lower zones or the middle and upper zones through the tubing or annulus, with the alternate zone blanked off in each case. This also serves to permit chokes to be changed by standard wire line methods without requiring a rig over the hole.



In addition to these advantages, the completion technique is designed to permit any one of the zones to be exposed to the tubing or the casing, or both, with the other two zones blanked off for circulating, treating, and testing. Fracturing treatments on individual zones at pressures up to 4,500 p.s.i. have been performed in wells using this type of completion.

This is another Otis-engineered completion designed to provide the ultimate in economical, versatile, and efficient alternate-zone selective production. For more information on alternate-zone, selective and multiple completions, or for help with any other specific completion problem, call the Otis office nearest you or write Otis, Dept. 4-W, P.O. Box 35206, Dallas 35, Texas. You'll find your Otis Well Completion Specialists ready to help you . . . anxious to serve you.

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OTIS

Engineering Corporation

General Offices:

6612 Denton Drive • Dallas, Texas

$2 Detector Cuts Corrosion Costs

A two-dollar, do-it-yourself corrosion detector is helping Shell Oil Co. save thousands of dollars a year on waterflood system maintenance.

Shell has spent as much as $100,000 a year plugging leaks and replacing pipe on its more than 50 waterflood projects in nine states.

It has been countering the problem by adding a chemical scavenger to the injection water. This scavenger removes the traces of oxygen which cause corrosion.

The new watchdog device tells maintenance personnel when there is oxygen in the water and when chemical treatment must be initiated.

It was developed by Shell chemist P. J. Raifsnider at the company's Emeryville (Calif.) research center.

The detector utilizes a common spark plug, a thin ribbon of steel, and a rubber band.

The steel ribbon is welded into a loop on the two electrodes of the plug and the rubber band is wrapped around the ribbon (drawing). The assembly is inserted into the waterflood piping through a threaded coupling. The loop is thus suspended in the water passing through the pipe.

With the device inserted into the piping, the thin ribbon is the first thing to corrode. When this happens, it is time to add corrosion-combating chemicals.

The rubber band around the ribbon accelerates corrosive action, just as dirt and scale deposits on pipe walls do. Testing with a simple circuit tester shows whether the steel ribbon is intact. The circuit tester can be a one-cell flashlight battery connected to a flashlight bulb. If everything is in order, the bulb will light.

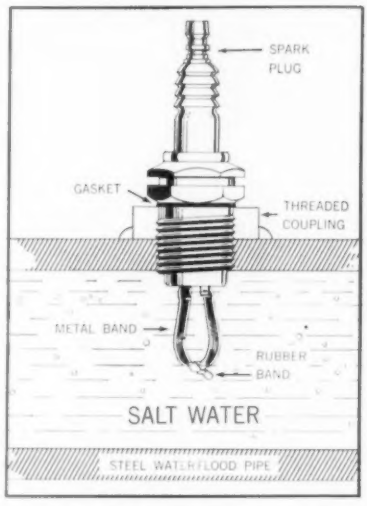
In operation, the electrical probe is threaded into the side of an injection pipe on the surface. The probe works something like a light switch. When everything is in order, and no corrosive situation is present, the electrical circuit is "on."

When the ribbon is pierced, the circuit is broken, and the bulb won't light, signaling an excess of oxygen in the system. At this point, more oxygen scavenger is added, thereby preventing corrosion damage throughout the system.

Results achieved with the system so far have been impressive.

At Shell's Joy waterflood project at Wichita Falls, Tex., for example, the number of leaks was cut from 20 per week to only one in a year.

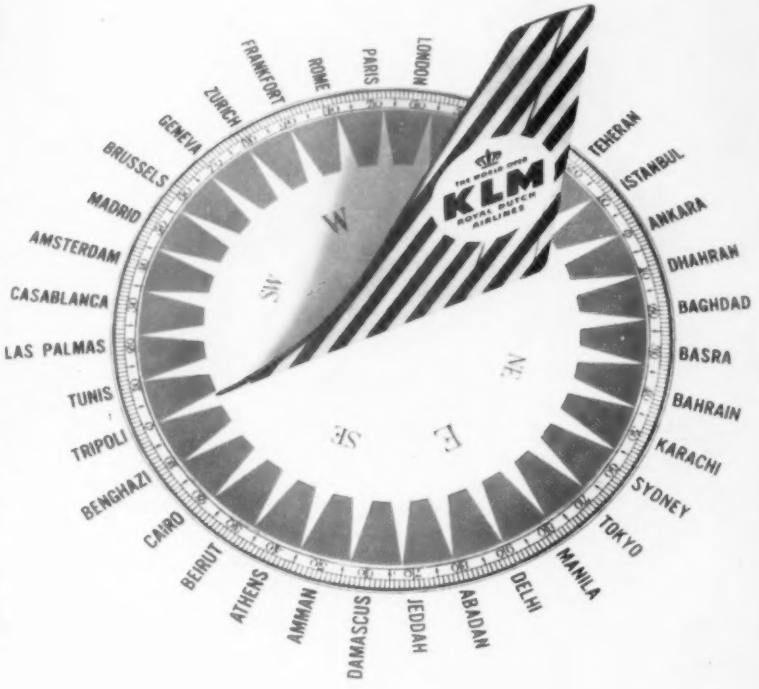
Shell also is using the system at major waterfloods in California and Illinois as well as in Texas.

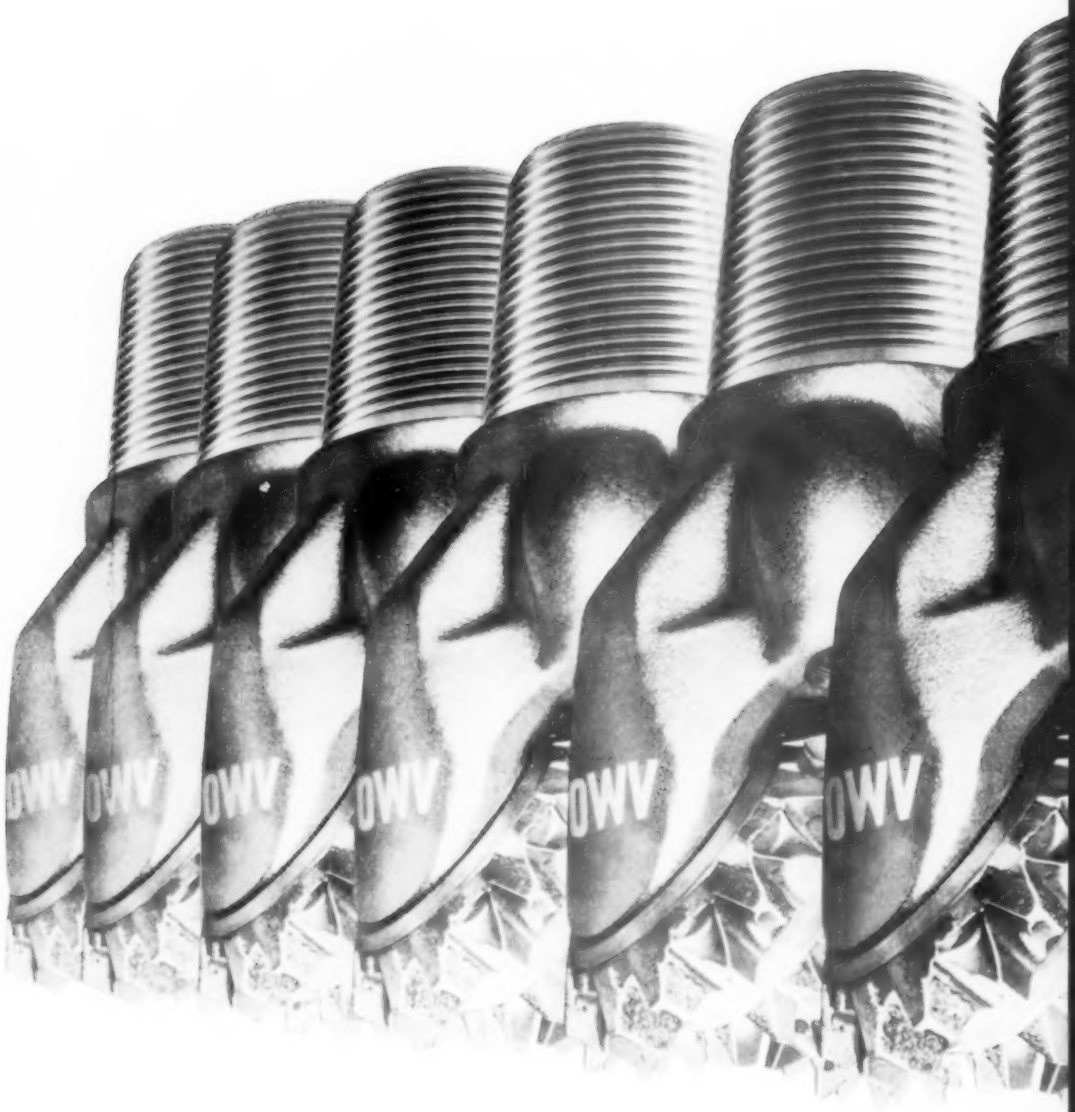


SCHEMATIC shows how corrosion probe is threaded into side of waterflood pipe.

"THE OILMAN'S AIRLINE" TO ALL THE WORLD

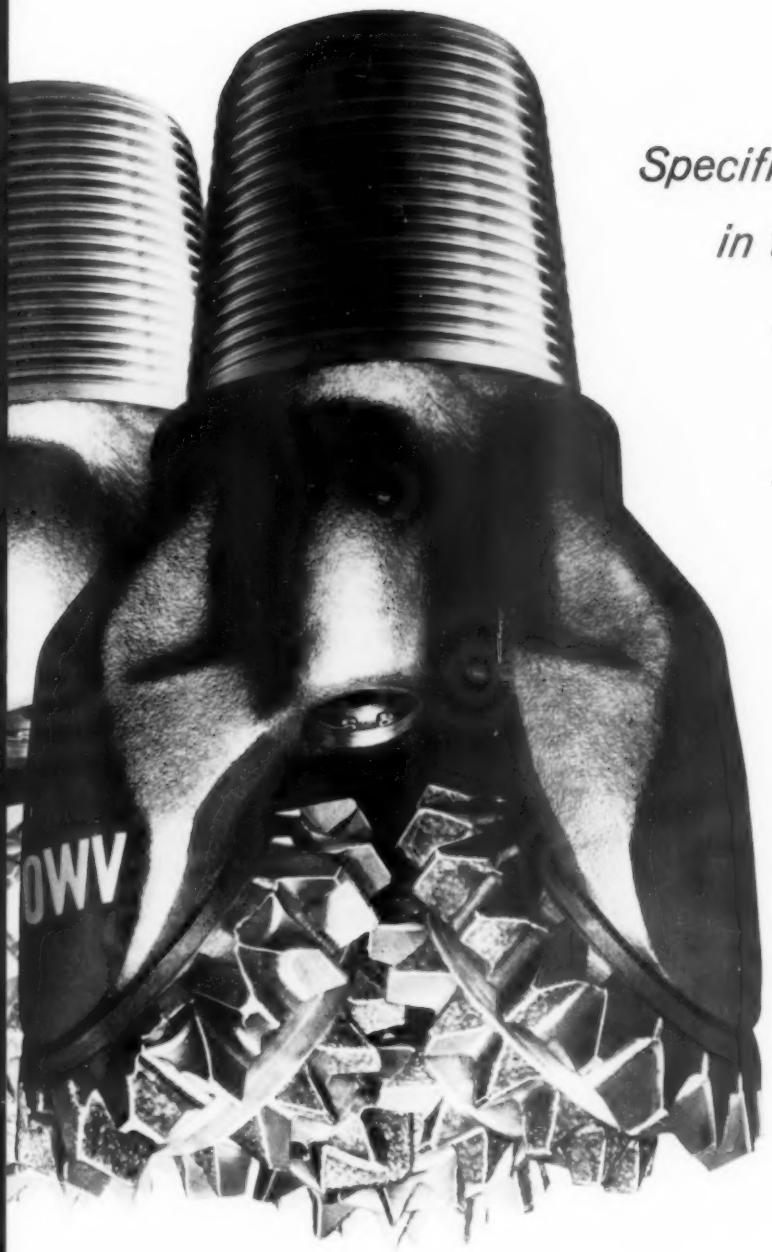
Pick a point on the compass and you'll see that KLM offers regular services to every major active oil center ■ Departures from New York, Houston, Montreal, Miami ■ A Petroleum Industry Service Department for consultation on your specialized problems ■ Experienced cargo personnel help you prevent costly critical shutdowns ■ A 41-year tradition of personalized service to passengers ■ For passenger service: call your travel agent or KLM office. For cargo service: call your cargo agent, freight forwarder or nearest KLM office. KLM, 609 Fifth Avenue, New York 17, New York. IT'S A TREAT TO GO DUTCH.





We don't change the name...we change

Regardless of how well a bit performs, our engineers are never satisfied. They are continually challenged by new facts from research and the field to find new ways to increase footage and penetration rate. The



Specific new improvements in the **Hughes OWV**

7 major changes in the OWV are helping to increase footage and penetration rate and lower hole costs

Change No. 1 lengthens life of bit under severe operating conditions. Bearing pin substantially strengthened.

Change No. 2 assures better bearing alignment during life of bit. Thrust bearing capacity increased.

Change No. 3 lengthens bearing life and cutting life of bit. Metallurgy of roller bearings greatly improved.

Change No. 4 protects roller race from "shirt tail" wear. This is achieved through a new hard pad design.

Change No. 5 assures a better balanced cutting structure. This results from improvement in cone design that strengthens teeth, spearpoint and gage.

Change No. 6 assures longer tooth life. Improved hardfacing provides greater resistance to wear.

Change No. 7 achieves an improved balance between bearing capacity and cutting structure that extends life of bit and permits use of heavier weights. The result: more hole per bit at lower cost!

the performance

seven recent improvements made in the already highly versatile, fast-drilling OWV have made it an even better performing bit. For the most economical hole you can drill . . . go all the way with Hughes.

HUGHES

ORIGINATOR AND WORLD'S LEADING DEVELOPER OF CONE-TYPE ROCK BITS

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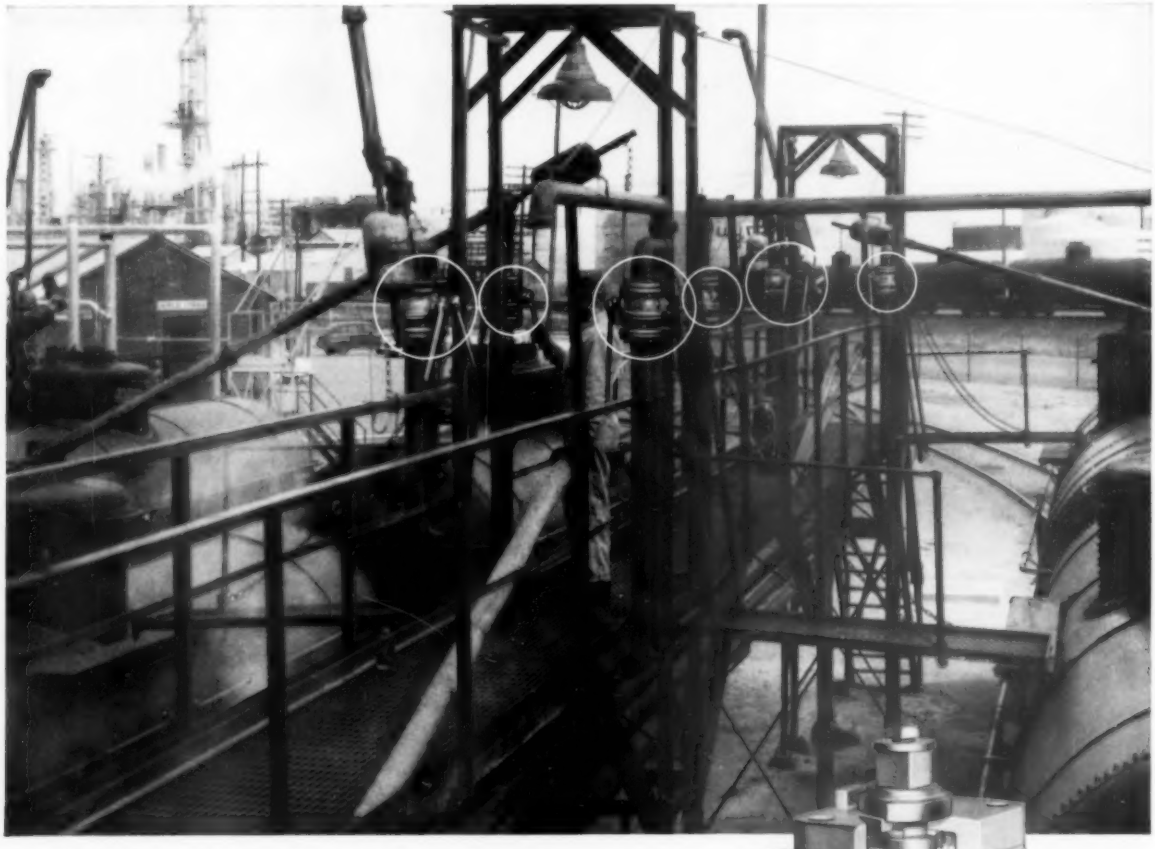


Throughout the country Rockwood Ball Valves are maintaining unbeatable refinery service — with these proved advantages:

Full Round Flow. No change in shape or volume of stream. No turbulence. Minimum friction loss.

Leakproof Seal. Exclusive spring loaded design holds ball against seat at very low pressure — even at vacuum.

Extra Long Service Life. Chrome-plated ball holds up under toughest abrasion, pitting and scratching.

Quick Opening And Closing with only a quarter turn.

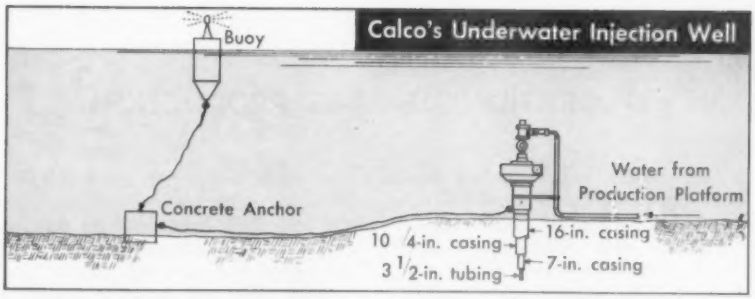
Rockwood Ball Valves deliver refinery liquids at the volume you want — with leakage eliminated and maintenance cut to minimum. Figure 551 shown at right is made in 3″, 4″, 6″, 8″ and 10″ sizes. Available with chrome-plated carbon steel ball, if required — and with Teflon* trim. For superior corrosion resistance specify Fig. 252, with stainless steel body and Teflon trim. Tested and listed by Underwriters' Laboratories, Inc. Write today for full information. Rockwood Sprinkler Company, A Division of the Gamewell Company, A Subsidiary of E. W. Bliss Company, 309 Harlow Street, Worcester 5, Mass. Distributors in all principal industrial areas.

*DUPONT REG. T.M.

Figure 551

ROCKWOOD BALL VALVES

FULL, ROUND FLOW



BUOY marks location of water-injection well off Louisiana. It is the industry's first . . .

Input Well Completed Underwater

A water-injection well has been completed on the ocean floor of the Gulf of Mexico by California Co.

This is the first time an underwater completion has been made on such a well. It also is only the fourth of any type known to be completed underwater and the third in U.S. waters (PW—Mar.17'61,p33).

Calco reported that it completed the injection well Feb. 15 on Louisiana State Lease 1,367 in the Block 2 Bay Marchand field. It will be used for a pressure maintenance project in an isolated fault block.

The well was drilled from a mobile drilling barge in 30 ft. of water. All subsea connections were made by a diver.

The underwater well is approximately 1,100 ft. from the producing platform where treating and injection facilities are now being installed.

The well is equipped with sand control, and all tubing and injection lines are plastic-coated internally for protection against corrosion.

The injection line is externally coated, and corrosion of the wellhead will be controlled by cathodic protection from the producing platform.

Calco says all wellhead equipment is an adaption of standard equipment.

The company decided that an underwater completion of a separately drilled well was the most economic of several possible approaches.

Alternatives were drilling the well directionally from an extension of an existing producing structure, or drilling from a mobile barge and completing on a caisson-type structure.

Big Junk Basket Shipped to Iran

This junk basket, said to be the world's largest, has been shipped to Iran.

The reverse-circulation-type basket, made by Bowen Itco, Inc., Houston, is for use in a 26-in. hole. It has 22-in. outside diameter and retrieves a 17-in. core with a 23-in. outside diameter mill shoe.

The basket is lowered into a hole to retrieve refuse that collects at the bottom as a result of bit failures, milling jobs, and objects being accidentally dropped down the hole during drilling operations.

Bowen Itco shipped a large spear—which it also called the world's largest—to Iran less than a year ago. The oil company requiring the equipment has not been identified.

Gulf Filters Out 'Singing' in Marine Seismic Records

A computer has helped Gulf Oil Corp. scientists come up with some unique electronic filters to eliminate "singing"—or resonance problems—in offshore seismic records.

Accurate mapping of offshore, subsurface formations often is impossible when the ocean floor is excessively hard or soft, Gulf says. Waves travel in a hard rock bottom much faster than in water. When such a large change in velocity occurs, much of the wave energy is reflected back.

In such instances, the company says, the "echoes" recorded by underwater hydrophones following the detonation of a seismic charge are jammed out by waves, that bounce back and forth in the water, reflecting alternately from the water bottom and top. This interference, or "singing," shows up on seismic tapes as smooth, undulating waves that blot out jagged reflections that normally would delineate the subsurface layers.

Gulf is still keeping technical details of its filters under wraps. But it does say, "These complicated units are able to effectively suppress the interfering reverberations, and allow the desired signals from subsurface layers to be recognized and recorded."

Gulf has been working on the problem for more than four years at its main technical center at Harmarville, Pa.

With the help of the lab's large IBM 704 computer, research specialists tested out theoretical answers to the problem in record speed.

The filters were designed and built by the main technical center's Instrument Development Division.

Singing was overcome and, for the first time, Gulf says, company geological teams mapped extensive areas of Lake Maracaibo, which previously had defied seismic exploration because of its mucky bottom. Seismic crews off Florida, where an excessively hard ocean floor had hampered former mapping efforts, were also helped.

Last year, Western Geophysical Co. announced it had successfully tackled the same problem.

Its method, called the Frequential Resonance Rejector System, takes into account any differences in characteristics of reflected energy. The method uses a battery of 40 one-cycle-wide, band-reject filters to suppress the singing signals recorded on magnetic tape (PW—Nov.11'60,p52).

What's New / IN EXPLORATION, DRILLING, PRODUCTION

Patrick Draw Cutback Extended Indefinitely

The temporary emergency order reducing oil production 30% at Patrick Draw field, Sweetwater County, Wyo., has been extended indefinitely by the state Oil & Gas Conservation Commission.

The original order (PW—Mar.17 '61,p24) limited production to 21,000 b/d to conserve natural gas being flared. State Mineral Supervisor E. A. Swedenborg estimated that continuation of the order would save $228,896 worth of gas before completion of two gas extraction plants now under construction. He said 7.65-million cf/d of gas would be saved under the cutback. Some 25-million cf/d are now being flared.

Producers in the field protested the cutback at a hearing last week.

Two oil-company mergers have been approved by directors and are awaiting approval of stockholders.

King Oil, Inc., Wichita Falls, will absorb Kutz Canon Oil & Gas Co., Denver. The merger will give King 4,358,804 bbl. of oil reserves and 62-billion net cu.ft. of gas.

In the other merger, North Star Oil Co. and Westwater Corp., Midland, Tex., will form North Star Oil Corp. William Moss, president of North Star, will become president of the new company, with reserves in excess of 2.5-million bbl.

•

Shell Oil Co. has announced plans for two gas-processing plants in Texas with a total capacity of 45-million cf/d.

A $2-million plant with capacity of 30-million cf/d will be built in Cass County. It will recover some 200 bbl. of condensate per million cu.ft. of gas and strip out 130 long tons of sulfur daily. Work is scheduled to be completed in November.

Shell also will build a plant to process 15-million cf/d of Sealy field gas in Austin County. Shell holds 70% of the reserves in the field and will operate the plant as a joint venture. Completion is scheduled for September. Daily production of liquids is estimated at 21,000 gal.

•

The New Mexico Oil Conservation Commission will appoint an industry committee to study all phases of commingling activity and recommend a policy to prevent possible abuses.

A. L. Porter, Jr., secretary-director of the commission, said: "Recently it has come to the commission's attention that abuses of the commingling privilege are probably occurring . . . standards for such installations must be established which will prevent the possibility of abuses."

•

Landa Oil Co., Dallas, has bought all capital stock of Larcon Oil Co., Magnolia, Ark., and will operate Larcon as a subsidiary.

The price paid for Larcon, which operates 80 wells in four southwest Arkansas counties, was not disclosed.

•

Oil and gas leases on 10,140 acres were sold for $285,520 in the March offering by the New Mexico state Land Office.

Superior Oil Co. paid $25,241 for 320 acres in Lea County in the high sealed bid. Shell Oil Co. paid $28,800 for 520 acres in Lea County to top the oral bidding.

•

Seismic surveying is now permitted on Pennsylvania state forest land where it will not conflict with activities of the state Department of Forests and Waters.

Application must be made through the district forester in charge of the area to be surveyed.

Seismic surveying formerly was per-

Louisiana Orders Compulsory Oil Unit

The first compulsory field-wide unitization of an oil pool under terms of a law passed last summer has been issued by Louisiana's Dept. of Conservation.

The order, effective Apr. 1, was issued under Act 441, which empowers the Commissioner of Conservation to order field-wide unit operation when three-fourths of the royalty owners and lessees agree to the plan.

The commissioner is empowered to order such field-wide unitization in any situation in which ultimate recovery of oil and/or gas could be increased, and waste and drilling of unnecessary wells prevented, subject to the prior three-fourths' approval of royalty owners and lessees.

The compulsory order applies to the 1,251-acre Broussard oil reservoir in the Erath field, Vermilion Parish. It also calls for initiation of a pressure maintenance program by water injection.

Testimony presented at commission hearings show the reservoir has a limited water drive, with a secondary gas cap causing and increasing the gas-oil ratio.

Reservoir pressure had declined, according to the testimony, from 5,869 psi. when the pool was opened in 1957, to 4,565 psi. in August, 1960.

It also was estimated that only 36% of the oil in place would be recoverable by primary methods, and that a pressure maintenance program would increase ultimate recovery by 3.4-million bbl. of oil.

Tidewater Oil Co., major operator in the unit area, was designated as operator.

Tidewater has 90% interest in the field, on an acre-ft. basis, and has drilled 11 of the 13 wells producing from the Broussard. Phillips Petroleum Co. holds 1.5% interest and Pan American Petroleum Corp. has 5.4%.

Tidewater, which initiated the application of the new law, testified at a Jan. 10 hearing that 80% of the royalty owners and 90% of the working interest owners had signed the unitization and unit operating agreement.

E. B. Miller, Jr., Tidewater vice-president, said the commission ruling "clearly served the best interests" of interested parties.

mitted only on land held under oil and gas leases.

Pennsylvania also is offering a publication on "Leasing and Operating Oil and Gas Lands" owned by the state.

It is available from the Division of Minerals, Department of Forests and Waters, Harrisburg, Pa.

•

Jett Drilling Co., Inc., Shreveport, La., has acquired working interest in 2,000 acres on the northwest flank of the Citronelle pool from Sun Oil Co.

Sun reportedly received $100,000 for its holdings, and retained a one-eighth override.

•

The Texas Railroad Commission has ordered operators of 23 salt water disposal wells in West, East, and North Norton pools, Runnels County, to halt seepage of water into a lake supplying water to the city of Ballinger.

The order cancels the disposal permits of the wells, but delays the effective date 90 days to give operators time to work over the wells so salt water cannot seep into zones above 800 ft. Surface pits will not be allowed.

•

Engineering

Dowell Division of Dow Chemical Co. has developed an electronic data computer service program that can cut fracturing and acidizing computation time from 12 hours to a few minutes.

Service engineers in the field relay information to the nearest Dowell center, which teletypes it to a computer center in Tulsa. Solutions are sent back in a matter of minutes. Similar analyses would require from eight to 12 hours using a slide rule or desk mechanical calculator, the company says.

The computer center can determine payout in days, cost of service job, hydraulic horsepower needed for the job, increase expected from the job, pounds of propping agent required, and other considerations.

An electronic manual-automatic control station, said to be the smallest of its type, has been designed to give a visual indication of system response in electronic systems.

The control station, available from Republic Flow Meters Co., a subsidiary of Rockwell Manufacturing Co., requires less than 17 sq.in. of panel space, and weighs 34 ounces.

The control station selects either the manual or automatic function. When the system is operating manually, control station pushbuttons can be used for manual control of the system.

•

Drilling Highlights

West Texas—Husky Oil Co. et al No. 1-A Hill, section 62, Bauer & Cockrell subdivision, Martin County, flowed 380 bbl. of 38-gravity oil on 4½-hour test of the Dean (Permian) sand at 8,462-502 ft. The prospect is 10 mi. southwest of Ackerly pool.

Utah—Pan American Petroleum Corp. No. 1 Salt Wash, section 15-23s-17e, Grand County, flowed 8-million cf/d of gas and some condensate on test of the Upper Mississippian at 8,629-679 ft. The wildcat is 22 mi. northwest of Mississippian production at Big Flat pool.

North Texas—Jack Grace Production Co. No. 1 Skinner & Jackson, section 2858, TE&L survey, Montague County, was completed for 792 b/d of 46-gravity oil through 15/64-in. choke and perforations at 6,734-71 ft. in the Viola (Ordovician). It is 1½ mi. southeast of Anson pool.

Alberta—Pan American Petroleum Corp. No. 1-A Melvin River, lsd 16-32-116-13w5, recovered 90 ft. of mud, 180 ft. of gas- and oil-cut mud, 120 ft. of mud-cut oil and 60 ft. of oil on test of the Slave Point at 3,857 ft. The wildcat is located some 150 mi. north of the nearest oil pool, Red Earth.

Wyoming—Humble Oil & Refining Co. No. 1 Poison Creek, section 32-37n-93w, Fremont County, flowed 2,122,000 cf/d through perforations at 5,411-41 ft. in the Fort Union formation. The wildcat is 20 mi. northwest of nearest gas production.

Southwest Texas—Texaco Inc. No. 1 K. D. Roche, W. H. Allen Survey, A-418, Refugio County, flowed 18-million cf/d of gas plus 1 bbl. of condensate per 1,054,000 cf/d of gas through perforations at 5,076-84 ft. It is 1½ mi. southwest of production.

Oklahoma—Gulf Oil Corp. et al No. 1 Wood, section 29-6n-8w, Grady County, was completed for 170 b/d of 47-gravity condensate and 5-million cf/d of gas through 13/64-in. choke and a series of perforations between 16,180-376 ft. in the Springer. It is the state's deepest Pennsylvanian production, and second-deepest pool. It is 2½ mi. northeast of Cement pool.

UNIBOLT PRESSUREMATIC VALVE

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Farm Market Is Slipping Away From Oil

Demand is there, but without improved oil-burning equipment oil men face stiff competition from LP-gas.

Oil-heat equipment makers, while concentrating on the residential market, are overlooking the farm.

This point was made earlier this month by G. W. Flint, of American Oil Co.'s research and development department.

He spoke at the API conference on distillate fuel combustion in Chicago.

Oil's plight on the farm is demonstrated most markedly by its failure to retain its place in the crop-drying market.

In tobacco drying, for example, LP-gas is replacing oil and other fuels at the rate of 7,500 installations a year.

LP-gas is gaining in grain drying, too, because its burners are simple, low in cost, and easy to maintain, says Flint.

Furthermore, LP-gas burners are easy to vary in heat output, which is an essential consideration in the final stages of crop drying.

"Heat variation is almost impossible with current distillate-fuel burners," he complains.

In corn drying, where the biggest potential new farm use for distillate fuel lies, oil is criticized because of its high soot formation and for the odors it imparts to grains.

"Briefly stated," Flint says, "improvements in [oil] burners will be necessary before distillate fuels can be expected to provide a substantial amount of energy required in drying crops."

There are other farm applications that will be closed to fuel oil—unless equipment improvements are developed rapidly. One new market is the use of distillate fuel oil for environment control.

In the farm home, for example, electricity is the primary source of energy for air conditioners, which are rapidly gaining acceptance in rural communities.

But because electricity is relatively expensive in most rural areas, Flint says, lower cost distillate fuels should be attractive.

Oil was introduced to the growing field of air conditioning last year when the first tests of oil-fired air conditioners were begun in four cities in Florida.

Environment control is just now receiving its due recognition by farmers for the handling of animals.

There are many ways in which it can be used.

For achieving the maximum gains in animal weight, Flint reports, it pays to cool the habitat of the animals during the summer.

Furthermore, Flint says, air conditioning of animal quarters "will eliminate the deaths of swine and poultry that often result from excessive summer heat."

In the winter, it is generally much cheaper to supply heat to animals by burning hydrocarbon fuels than by giving them additional quantities of feed for this purpose.

Several new heating schemes are under consideration, Flint says, such as the warming of slabs in animal lots and barns, and the heating of floors in milking quarters.

"Heating of poultry houses shows the greatest promise," he says, "since poultry consume large quantities of food to keep warm."

"When year-round comfort control for farm animals reaches its peak," Flint concludes, "the fuel requirements of this use will likely exceed the fuel requirements of the farm house."

Atmospheric control of storage facilities offers another stimulating challenge to oil marketers who are anxious to develop the growing farm market.

This new agricultural tool depends mostly, however, on refrigeration, and consequently puts great emphasis on the improvement of oil-fired cooling units.

The potential demand for refrigerated storage will be far-reaching, and is likely to extend quickly to all farms where the warehousing of seeds, eggs, or fruits is important.

Portable Stations Fill a

DERBY REFINING CO. is erecting one of these portable outlets every week. They come equipped with rest room fixtures, shelves, a desk, and even mop and broom racks.

Another moderately sized marketer—Derby Refining Co.—is finding that it can fill the gaps in its marketing territory with portable, steel service stations.

"Derby-brand gasoline is sold from 600 service stations in eight midwestern states," reports H. D. Moore, the newly instated president of Derby Refining. "But there are many places in our market area where distribution is too sparse."

As a result, he says, "We have started a crash program that will fill in these blanks as quickly as possible with modern, functional, attractive service stations."

The buildings that Derby is using were inspired by a European design. The aim is to combine sufficient space and maximum eye appeal while minimizing cost.

The red-white-blue stations are being constructed for Derby by Valen-

Shell and Tidewater Commence Moves to Centralize Accounting

Two more companies—Shell Oil Co. and Tidewater Oil Co.—are preparing to centralize accounting for their marketing operations.

The Shell move will shift scattered West Coast data processing centers to a single office to be constructed near San Francisco.

Tidewater, meanwhile, is preparing to concentrate many of its marketing accounts in Los Angeles.

The moves are symptomatic of a trend among major oil companies to hold the line against rising accounting costs through the introduction of more efficient data-processing.

One of the most impressive examples of this trend to date has been the consolidation of nationwide credit-card handling by Standard Oil Co. (Ind.). This move created the world's largest centralized credit-card office, in Chicago (PW—Dec.30'60,p54).

At Tidewater, steps are being taken to consolidate the company's entire retail accounting operations in Los Angeles.

This transfer, which is expected to begin shortly after Apr. 1 and to be completed during the summer, will combine activities that are now performed separately in the company's eastern and western division.

In introducing its centralization, Tidewater believes that it will be able to take advantage of substantial cost savings derived from handling all accounts in one location.

The company is taking steps to assist workers who cannot transfer to Los Angeles, in order to minimize employee dislocation problems resulting from the consolidation.

The employee relations department will help employees who do not wish to move, or for whom no openings are available at present, to find jobs with other employers.

Terminal allowances—a week's pay for those with less than one year's service, and two weeks' pay for those with more than one year—will be paid.

At Shell, a new data center is planned to house the company's accounting for its marketing operations in 11 western states.

At present, the data processing for these operations is divided among three centers—in Seattle, San Francisco, and Los Angeles.

The centralization move will concentrate all such activities in Menlo Park, Calif.

Some of the functions that will be gathered under one roof there include accounting and statistical controls, payrolls, cash receipts and disbursements, tax payments, retail credit collections, and budgetary control and related functions.

In making its centralization, Shell will be able to switch from conventional tabulation equipment to high-speed magnetic tape machines.

Centralization will also eliminate considerable paperwork and reduce duplications in equipment and job functions.

Under the present arrangement, specific accounts are controlled through each local office, necessitating periodic transfer of files for consolidation of records.

Use of IBM 1401 magnetic tape equipment is also expected to produce savings in data storage space and processing time, Shell says.

Marketing Void

tine Manufacturing, Inc., Wichita. On pilot models, the company omitted the bays so that pump sales may be emphasized, but the stations can be expanded to include lube bays if required.

Valentine is turning out one station every five days—which is just fast enough to keep the Derby field force scouring for new locations.

But once they've found desirable sites, it takes only three weeks to open a portable station there. "This has cut our time and installation costs in half," Moore says.

Thus far, Derby has 33 of its portable stations in some phase of construction.

To coincide with the installation of new stations, Derby has introduced a "New Look" program.

One aspect of the program is a new training course for dealers, in which clean stations are emphasized.

Another phase of Derby's "New Look," which will be announced in late summer, is a jobber modernization program.

In addition, the company has already laid plans to push its credit card circulation up 45% to 65,000.

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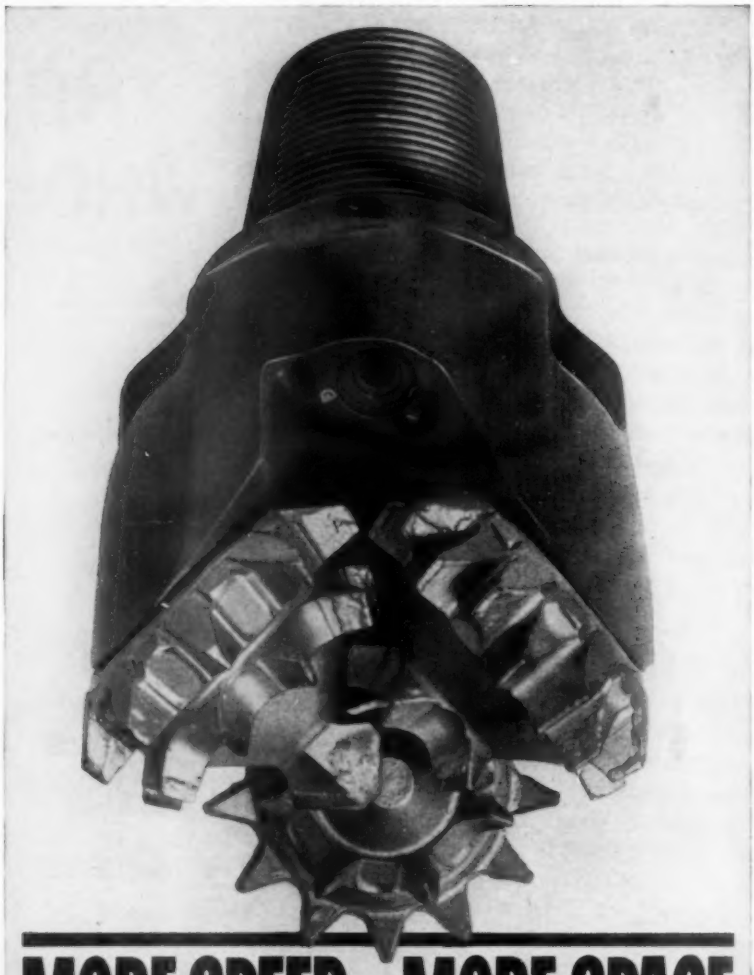

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AIR FRANCE CARGO

What's New
IN MARKETING

Can advertising get people to drive more? Some evidence of the effects of newspaper and magazine promotion suggests that it can.

Vernon A. Bellman, vice-president of the American Petroleum Institute's marketing division and marketing vice-president at Mobil Oil Co., provided several encouraging examples for the Ohio Petroleum Marketers Assn. last week.

A tourist attraction 40 mi. north of New York, Bellman said, tripled its daily attendance by advertising in a newspaper the week before, while a quaint village in Massachusetts increased its trade by 20% with an advertisement.

A magazine article sent an "influx of tourists" to a lodge in Granite Falls, Wash., whereas last summer a tourist attraction in Texas tripled its business by advertising in a newspaper travel supplement.

With these examples as a guide the API's Travel Development Committee, Bellman said, has started a test of its own proposed ad campaign.

•

The state attorney general is investigating the causes of gasoline price wars in California.

He will report next month to the state assembly, which unanimously requested the investigation following widespread reductions in gasoline prices.

•

Tidewater Oil Co. converted another jobber last week to its growing list of consignment agents. The latest one is Glens Falls Distributing Co., New York.

By purchasing the assets of this company, Tidewater acquires five service stations, several dealer and commercial accounts, and a bulk plant.

•

A "nation of scooters." That's what continued increases in gasoline taxes will bring, predicts J. E. Swearingen, president of Standard Oil Co. (Ind.).

He told the House Ways & Means Committee this month that rising taxes reduce gasoline demand and encourage motorists to buy small cars.

Swearingen's remarks tended to rebut the theory—put forth by the Bureau of Public Roads—that gasoline taxes are still too low to have any economic impact on motorists.

The Market Trend

PETROLEUM WEEK

March 31, 1961

Refiners Can Quote Away Their Margins

Too many prices seem to be sliding downhill nowadays. Admittedly, some of the declines are seasonal. But it never looks healthy when just about everything is slipping.

Most disconcerting has been the fall in gasoline prices in the Upper Midwest, in the Mid-Continent, and at the Gulf. Chicago truck prices were shaved from 12.375¢ to 12¢ a gal. Oklahoma quotes dropped from 12.5¢ to 12¢. Gulf Coast cargoes were generally off 0.5¢, and in rare instances single cargoes were offered as much as 1.5¢ off the old prices.

On a volume-dollar basis, these gasoline reductions can prove very expensive as the spring motoring season gets under way. Stocks of gasoline are pushing to record levels, and the recent gasoline cuts easily could take on an air of permanency.

Even the seasonal declines look as if much of the course is yet to be run. Gulf Coast cargoes of No. 2 have fallen from 9.5¢ to 9.25¢, but 8.875¢ is not an impossible figure right now. Spot cargoes at the Gulf can land in New York about 0.7¢ below contract deliveries, a situation not conducive to stability.

"You ain't seen nothing yet" is the comment in the LP-gas markets about last week's reductions. In East and West Texas, propane was slapped back 1¢, and butane 1.5¢. Oklahoma producers reduced their posted prices from 5¢ to 4¢, but one estimated that about 60% of his sales probably will carry a lower number.

And bunker "C" fuel, seasonally immune up to now, has shown signs of weakening at the Gulf. The quote is $2.30 a bbl., but it is estimated that $2.20 can be done, and maybe even $2.10.

If this downtrend hangs on, refiners' margins will fade quickly.

Delivery Prices Gaining for LPG:

A new trend is showing up in the propane markets. More and more contracts are being quoted on a delivery basis, rather than f.o.b. Group 3.

This swing from f.o.b. to delivered often means that sellers are trying to hide the weakness in terminal prices. In the Upper Midwest, the situation is diagnosed as one of too much supply and too many pipelines.

Crude for Brazil:

Texaco will supply 2-million bbl. of Arabian crude to Petrobras, Brazil's oil agency, for delivery in April and May. Give or take a few pennies, the price is $2.10 a bbl., landed at Santos.

Future for 'Gas'?

A $1,000 bet was made last week: That ten years hence 75% of U.S. motor cars will still be running on petroleum derivatives. Pay-off will be made at Maud Chez Elle in New York on Mar. 23, 1971.

The Market Place

AROUND THE WORLD

Current key crude and product prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service, a McGraw-Hill Publication.

All prices as of March 27

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U.S. Gulf Coast, cargoes
- Gasoline, 98 oct prem 11.75-13.25
- Gasoline, 92 oct reg 10.75-11.5
- Kerosine 9.875-10.75
- Heating oil, No. 2 ..... 9.25-10
- Gas oil, 48-52, d.i. 9.5-9.75
- **Fuel oil, bunker "C" ..... $2.20↓-2.40**

Caribbean, cargoes
- Avgas, Grade 100/130 ..... 14.75
- Gasoline, 93 oct research prem 10.875
- Gasoline, 87 oct research reg 9.5
- Gasoline, 80 oct research 8.75
- Gasoline, 70-72 oct motor method 8.625
- Kerosine 9.875
- Heating oil, No. 2 ..... 8.625
- Gas oil, 48-52 d.i. 8.875
- Fuel oil, bunker "C" $2.00

New York Harbor, barges
- Kerosine 11.45-11.9
- Heating oil, No. 2 ..... 10.45-10.9
- Fuel oil, No. 6 ..... $2.62

Okla.-Group 3, northern shpt., bulk
- **Gasoline, 91 oct reg ..... 12↓-13.25**
- **Kerosine ..... 10.375-10.75↓**
- **Heating oil, No. 2 ..... 9-9.5↓**
- Fuel oil, No. 6 ..... $1.80-1.90

Chicago, bulk
- **Gasoline, 92 oct reg ..... 12-12.25↓**
- Heating oil, No. 2 ..... 9.75-11.85
- Fuel oil, No. 6 high sulfur 7.65

Los Angeles, rack
- **Gasoline, 88 oct reg ..... 10.8↓-12.65**
- Diesel fuel, PS 200 ..... 7.75-11.25
- Light fuel, PS 300 ..... $2.90
- Heavy fuel, PS 400 ..... $2.10-2.45

Natural Gasoline, Grade 26-70
- FOB Group 3 ..... 4.5
- FOB Breckenridge, Tex. 4

LP-Gas
- **Propane, Oklahoma (Group 3) ..... 4↓***
- **Propane, Baton Rouge ..... 4.625↓-4.875↓***

Pennsylvania Lubes
- Bright stock, 25 p.t. 26
- 200 vis. neutral, 25 p.t. 28

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent, 95 v.i. 26-27
- Neutral solvent, 200-210 vis. 23-24

Gulf Coast Lubes
- Bright stock, solvent, 95 v.i. 26-27
- Neutral, solvent, 200 vis. 23-24

**Effective Mar. 27.*

Eastern Hemisphere

Singapore (Pulau Bukom) cargoes
- Avgas, grade 100/130 ..... 15.5
- Gasoline, 79 oct research 9
- Kerosine 9.75
- Gas oil, 48 d.i. minimum 9

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, (Okla.-Kan.), 36.0-36.9 ..... $2.69-2.97
- **North Dakota, 36.0-36.9 ..... 2.47-2.87**
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9 ..... 3.50
  - Gulf Coast, Upper & Lower, 26.0-26.9 ..... 2.92-3.22
  - West Texas, sweet, 36.0-36.9 ..... 3.00
  - West Texas, N.M., inter., 36.0-36.9 ..... 2.93
  - **West Texas, N.M., sour, 32.0-32.9 ..... 2.71-2.85†**
  - East Texas, flat 3.05-3.25
  - Mirando, 28.0-28.9 ..... 2.96-3.31
- Illinois Basin, flat 3.00
- Pennsylvania Grade, Bradford dist., flat 4.80
- California, Signal Hill, 21.0-21.9 ..... 2.33†
- North Louisiana-Arkansas, 36.0-36.9 ..... 2.72-3.02
- Wyoming, sweet, 36.0-36.9 ..... 2.85-2.90
- Wyoming, sour, 32.0-32.9 ..... 2.63-2.71

Canada (flat prices, at the well)
- Pembina (Alta.) $2.38
- Leduc-Woodbend (Alta.) 2.53
- Redwater (Alta.) 2.42
- Steelman A (Sask.) 2.425
- Virden (Man.) 2.285

Venezuela (Cargoes, FOB lifting port designated)
- San Joaquin, 41.0-41.9, Puerto la Cruz $3.10
- Oficina, 35.0-35.9, Puerto la Cruz 2.80
- Tia Juana, Medium, 26.0-26.9, Amuay 2.30
- Bachaquero, flat, La Salina 1.85
- Lagomar, 31.0-31.9, Cardon 2.55
- Lagunillas Heavy, flat, La Salina 2.07

†Differential per deg. of grav. varies

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabia, 34.0-34.9, Ras Tanura $1.80
- Safaniya, 27.0-27.9, Ras Tanura 1.47
- Iran, 34.0-34.9, Bandar Mashur 1.78
- Iran, 34.0-34.9, Abadan 1.73
- Iraq, 35.0-35.9, Fao 1.72
- Kuwait, 31.0-31.9, Mina-al-Ahmadi 1.59
- Qatar, 41.0-41.9, Umm Said 1.95
- N. Zone, Burghan, 23.5-24.4, Mina Saud 1.48
- N. Zone, Ratawi, 23.5-24.4, Mina Saud 1.41
- N. Zone, Eocene, 16.5-17.4, Mina Saud 1.28

Middle East, Eastern Mediterranean
- Arabia, 34.0-34.9, Sidon $2.17
- Iraq, 36.0-36.9, Tripoli, Banias 2.21

North Africa, Bougie, Algeria
- Hassi Messaoud, 40 and above $2.65

KEY TANKER RATES

(Last paid, per long ton, single voyage)

- **U.S. Gulf-New York, clean (ATRS—27½%) $2.07↓**
- **U.S. Gulf-New York, dirty ... (ATRS—25%) $2.14↓**
- **NWI-USNH, dirty ..... (ATRS—60%) $1.10↑**
- **NWI-UK/Cont., dirty .... (Scale—62½%) 12/3*↓**
- Persian Gulf-UK/Cont., dirty ..... (Scale—50%) 30/9*
- Persian Gulf-USNH, dirty ..... (USMC—65%) $4.45

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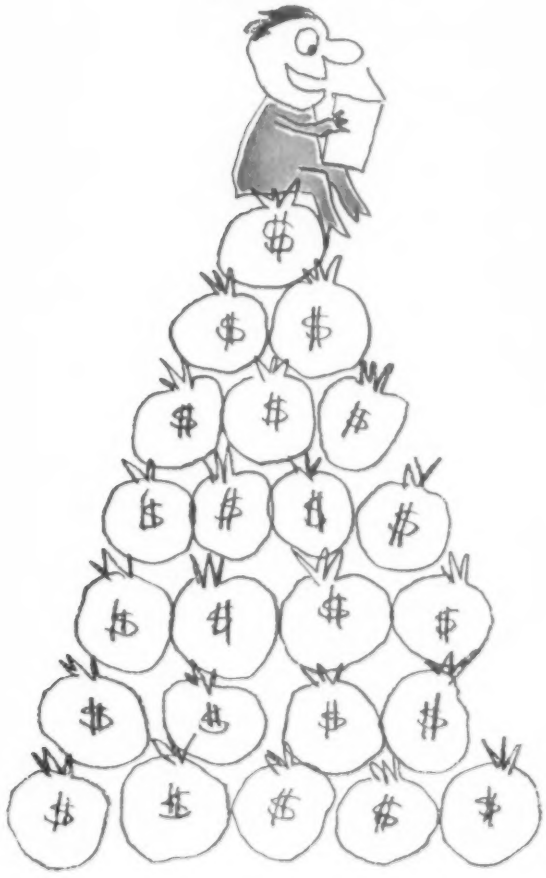

Most of us recall at least one classmate who "never cracked a book", but somehow got by. Wonder where he is today?

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Mideast Newcomers Slate Production

The Japanese and the Italians, newcomers to the Middle East, are about to join the ranks of Persian Gulf producers.

Neither has started regular crude exports yet. But it was clear last week that Japanese output offshore in the Neutral Zone would start flowing to Japan shortly. And Italian production in Iran's waters, on the opposite shores of the gulf, will start moving to Italy before the year is out, if only at a minor rate.

The formal start of Arabian Oil Co.'s crude exports to Japan from the offshore Khafji field in the Neutral Zone will be celebrated next week.

King Saud and the Sheikh of Kuwait will inaugurate the first regular shipment, along with the president of Arabian Oil, which holds the undivided offshore oil interests of both states.

The Japanese firm so far has completed ten producers, which averaged between 6,000 b/d and 7,000 b/d on test.

Permanent facilities for producing and exporting 200,000 b/d of Khafji crude will be completed by September, 1962, under a $70-million contract Arabian Oil has just awarded to J. Ray McDermott & Co., of Houston. McDermott also constructed the company's temporary facilities.

ENI's NEW MOBILE PLATFORM, built in Italy, will be towed to Iran next week.

In Iran's waters, the Italian ENI-Agip group has more modest expectations at this stage. It aims for 40,000 b/d production by 1963 from the offshore tract it holds with National Iranian Oil Co.

Last week its first 18,000-ton cargo of crude, produced in tests of its initial wildcat—the only one completed so far—was delivered to Italy.

ENI president Enrico Mattei said at the ceremonies that production would average 6,000 b/d this year, rising to 16,000 b/d in 1962.

ENI's drilling operations in Iran's waters will be stepped up with a new mobile LeTourneau platform built in Italy (picture) by ENI's manufacturing affiliate.

The unit, called "Gatto Selvatico" (Wildcat), has just been officially launched near Leghorn, and will be towed to the Persian Gulf next week. ENI's initial wildcat was drilled from a fixed platform, from which a second test is being drilled.

World Bank Predicts Lower Oil Prices

The World Bank sees downward pressures continuing on world oil prices and is advising Venezuela to plan on a possible further slight reduction in market prices for its crudes in the years ahead.

This is one of the points made in a detailed analysis of the world oil outlook and the Venezuelan industry's deteriorating competitive position in it.

The oil analysis is included in a 450-page study of the Venezuelan economy that was made available last week. The report was prepared at the request of the Betancourt government by a 12-member survey mission organized by the International Bank for Reconstruction & Development.

For the immediate future, the bank's survey mission assumes world oil market prices up to 1963-64 will average some 3% below those prevailing in 1959-60—meaning some 10% below prices posted in Venezuela as of April, 1959.

The mission considers any further "appreciable" reduction unlikely during this period, because forces making "orderly marketing"—on the part both of major companies and of governments of Venezuela and Middle East producing countries—are expected to be "sufficiently strong."

For this reason, the report predicts that production from new sources of supply may result in a slower rate of demand growth for both Middle East and Venezuelan oil, rather than in a substantially lower level of prices.

For the longer term, Venezuela must take into account the possibility of "somewhat lower" prices for its oil, the mission says, though it foresees no abrupt change in price levels. It did not, however, undertake a detailed analysis of long-run price prospects, emphasizing only the uncertainties of the market situation and forces making for increased production and intensified competition.

The mission expects Venezuela's long-range production growth will be "much slower" than heretofore, and "probably" slower than in the 1960-64 period, during which, it is "inclined to feel," a 4% annual increase, starting this year, is "possible."

But for the longer term, "there must remain a large element of uncertainty," it says, due to the combined effects of likely trends in world markets, plus conditions within Venezuela. Among the latter it cites the question of continued availability of adequate reserves; and considerations,

dependent on future government economic policy, affecting company decisions to produce in Venezuela.

The mission considers it "unfortunate" for Venezuela's economy that its oil industry is in a "weakened" position.

For many years to come, the mission notes, the Venezuelan government's revenues from oil "will largely determine the extent and pace of the country's economic development."

The Venezuelan oil industry's deteriorating position, it says, arises primarily from two developments: the great increase in world oil supplies relative to demand, with much of the increase in the form of low-cost production; and the decreasing profitability of Venezuelan oil operations compared with other producing areas in the Middle East and North America.

These developments, together with "certain policy measures of the government," have resulted, the mission says, in the gradual weakening of Venezuela's world petroleum position.

The mission advises the government to "review its petroleum policies" to strengthen Venezuela's position in the world oil market through reduction of costs and an increase of confidence in both the short-term and long-term prospects of the petroleum industry.

It suggests three alternative tax-relief measures to strengthen the competitive position of the industry, to encourage investment, "and, above all, to increase the level of confidence."

(1) Granting of a reinvestment allowance, whereby no income tax would be levied on the amount of profits equivalent to all or part of the net investment in a given year.

(2) Changing the price base for royalty payments by relating them to Venezuelan prices (posted, actual, or a formula involving both), rather than to Texas prices, which, the mission says, are no longer closely responsive to competitive pressures in the world markets.

(3) Modifying or eliminating the special low exchange rates for petroleum transactions—which are 3.07 to 3.09 bolivars to $1—to push them closer to the present general rate of 3.33 to 3.35.

Some such reduction in the oil industry's fiscal burden would result in a net benefit to the Venezuelan economy over a period of years, the mission believes.

Of course, it points out, the government would have to weigh the likely losses in revenue and foreign exchange that would directly result from such tax incentive devices against the spur to competitiveness and production that they would embody.

In fact, it says, introduction of pay-as-you-go tax systems could minimize or wholly offset the immediate impact on the government's cash position of such incentive measures. (Venezuela recently passed such a law, and is currently working out regulations for implementing it.)

The government's creation of a state oil company, and its announcement that no further oil concessions will be granted to private enterprise, are steps that could "greatly affect" longer-run prospects for development of Venezuela's oil resources.

Taken together, the mission says, these measures "have raised serious doubts in the minds of Venezuelan and foreign investors concerning the role the private sector will be encouraged to assume in future oil development." And the government, it notes, has "failed to indicate whether, and on what conditions," private capital would be encouraged to participate.

The mission is "convinced" that future development of Venezuela's economy would be greatly advanced if the government were to recognize "explicitly" the positive role that private capital can continue to play in developing Venezuela's oil resources.

"The essential point," in the mission's view, "is that no doctrinaire stand should be taken" in opposition to granting concessions or otherwise encouraging private oil activity.

French Firm Makes Libya Discovery

Cie. Francaise des Petroles has an oil discovery, perhaps its first significant one, in far western Libya, near the Tunisian border (map).

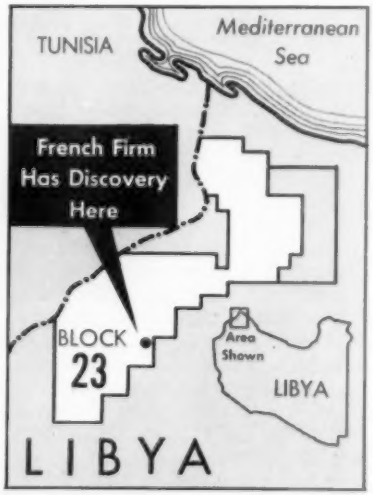
The French major made the strike in Block 23, about 100 mi. south of the Mediterranean. Oil was found at 8,100 ft., but test results were not announced.

The discovery comes after 13 tries by CFP, one of the earliest firms to be granted Libyan exploration concessions.

CFP, operating through Cie. des Petroles Total (Libye), holds rights to four blocks totaling 13,100 sq. mi.

In 1959 a test in Block 49, far south of the present find, produced oil at the rate of 100 b/d. However, two other holes in the same area were dry. The company has, in addition, drilled five dry holes on Block 23, and others on Blocks 24 and 61.

Just two of the original nine concession-holders—British Petroleum and Hunt International—have so far failed to find oil.



The first Libyan concessions were granted in November and December, 1955, and January, 1956. Esso Libya, Shell, Mobil, American Overseas (owned jointly by Texaco and California Standard), Oasis Oil (owned by Amerada Petroleum, Continental Oil, and Ohio Oil), and Libyan-American Oil (a subsidiary of Texas Gulf Producing Co.) have already racked up significant oil finds.

BP recently acquired a 50% interest in Hunt's Block 65 in eastern Libya.

Meanwhile, another rig is being moved into Libya for Esso operations there.

Esso Libya now has four rigs operating in Libya, and the new one will replace one of them. In addition, Esso Sirte, operating on a farmout from Libyan-American Oil Co., has three rigs working.

Built by Ideco, Inc., of Beaumont, Tex., the new rig has been consigned to Camdrill International, Esso's Libyan drilling contractor. It is scheduled to arrive in Libya in April.

What's New / AROUND THE WORLD

VENEZUELA—The new state oil company may try to line up its own export outlets for crude production it expects to develop in Lake Maracaibo.

There have been many indications in the past that established producers in Venezuela might be expected to market crude produced by Venezuelan Petroleum Corp. in operations offsetting their own. But last week, the Oil Minister said that offers "under conditions that can be advantageous" have been received for VPC crude from small Pacific Coast refiner-distributors in the U.S. VPC, he said, also expects to discuss possible sales to Latin American national oil companies.

VPC expects to spud its first test in May, south of a mid-lake Shell tract. By year's end, Venezuela's president said recently, it will be able to drill an average of one well per month.

•

GABON—Mobil and its French partner, Spafe, will spud an offshore wildcat here, the first such test in the franc zone, next August, Spafe's president announced recently in Paris.

The companies plan a 16-month drilling program on marine structures near existing onshore oil fields.

•

WEST GERMANY—Spring, 1963, is the target date for completion of West Germany's first power station using natural gas. Construction of the plant, at Landesbergen on the Weser River, is now under way. Initially, the plant will use about 16-billion cu. ft. of gas per year.

•

TUNISIA—An Italian-Tunisian government company formed by the Italian state-owned ENI group has called for bids for the design and construction of a 20,000 b/d refinery. The firm has not yet chosen a plant site, but says the refinery will probably be built either at Bizerte or La Goulette, in Northern Tunisia.

•

LIBYA—The Esso Sirte-Libyan-American Mabruk oil field is not as big as preliminary estimates indicated, Texas Gulf Producing Co., Libyan-American's parent, reveals in its annual report.

The company says capacity of the four field wells is "much lower than expected." Water flooding will probably be required to produce oil from the field, which is scheduled to go into production next year.

•

WEST GERMANY—A trade-union-sponsored motorists' organization has entered the competitive German market, opening a service station in Hamburg to sell gasoline at 7.6¢ below branded prices.

The group expects to open stations in about 40 German towns by the end of the year. Products are sold only to members, who must be trade unionists.

•

GUATEMALA—Atlantic Refining has given up on exploration in Guatemala. It has already ceased operations there after several years of exploratory effort, Atlantic told its stockholders. The company held joint interests with various groups of companies and participated in drilling three dry holes.

•

VIETNAM—The government apparently is nearing a choice between competing proposals for a 22,000 b/d refinery. It is currently reviewing two offers—one made jointly by Shell and Stanvac, and another by Phillips Petroleum with Summit Industrial Corp., of New York—to select "the most advantageous for Vietnam." The government has already selected the deep-water-bay area of Camranh, 180 mi. northeast of Saigon, as the site for the proposed plant.

•

LIBYA—Atlantic Refining is seeking another major to join it in exploration of its offshore concessions here, the company said in its annual report. Atlantic got the four concessions, which cover 10,500 sq. mi. in the Gulf of Sirte, last year.

•

NETHERLANDS—Tidewater Oil Co. has set up a Dutch subsidiary in Rotterdam, where it plans to build storage facilities by 1962 as another step in its marketing-refining expansion in Europe (PW—Sep.18'59,p64). Tidewater's first European refinery, a 20,000 b/d plant, will be put on stream in Denmark later this year.

•

LIBYA—The German firm Elwerath has applied for a second Libyan concession, this one in Fezzan province, between Block 77, held by Deutsche Erdoel, another German firm, and Block 85, held by the Italian independent, Ausonia Mineraria. The acreage sought by Elwerath has not previously been granted for oil exploration.

•

VENEZUELA—Crude production in February climbed to 3,082,000 b/d—within hailing distance of the record 3,095,937 b/d set in February, 1959. The two-month average for 1961 was 5% above the same period last year. The official government figures, in 000 b/d:

Company*	Feb. '61	2-Mos. Avg. '61	2-Mos. Avg. '60
Creole	1,245.0	1,235.6	1,129.5
Shell	749.8	753.8	787.4
Mene Grande	426.1	418.5	448.0
Mobil	114.9	119.9	113.5
Sun	89.7	89.2	60.8
Superior	81.2	76.8	27.1
Richmond	78.0	78.8	48.5
Sinclair	65.4	64.7	46.5
Texaco	58.9	56.9	57.7
Phillips	46.7	46.9	58.7
San Jacinto	32.0	30.3	44.2
Atlantic	27.8	27.7	25.2
Signal	23.3	22.9	30.4
Mercedes	16.7	16.8	17.5
Caracas	8.7	8.4	7.1
Coro	6.8	7.1	8.0
Talon	1.2	1.2	1.1
Continental	0.8	0.7	—
Totals	3,082.0	3,056.2	2,911.2

*For joint ventures, total group production is listed under operator's name.

Eleven Oil Men Safe

SPANISH SAHARA—Eleven oil men who had been kidnapped from their Spanish Sahara camp were released by Morocco last week.

The technicians, including three Americans, were part of a United Geophysical seismic crew working on acreage held by Union Oil Co. of California.

The Americans were James B. Gilbert, of Littlefield, Tex.; Dale Miller, of Bakersfield, Calif.; and John Cosgriff, of Big Timber, Mont.

Gas reforming hits a new high Engineering news was made in France recently, when a Chemico high-pressure gas reform furnace operating at 250 psi was placed on stream. Prior to the completion of this project, no gas reformer in the world had ever operated at pressures above 175 psi. Design innovations incorporated in this plant reduce compression requirements and increase heat recovery.

This historic breakthrough in gas reforming is indicative of the skill and experience which Chemico brings to all process engineering problems. Chemico services to clients in the process industries range from initial laboratory research and testing to final construction and start-up. If you are interested in learning more about Chemico, write to "Department B".

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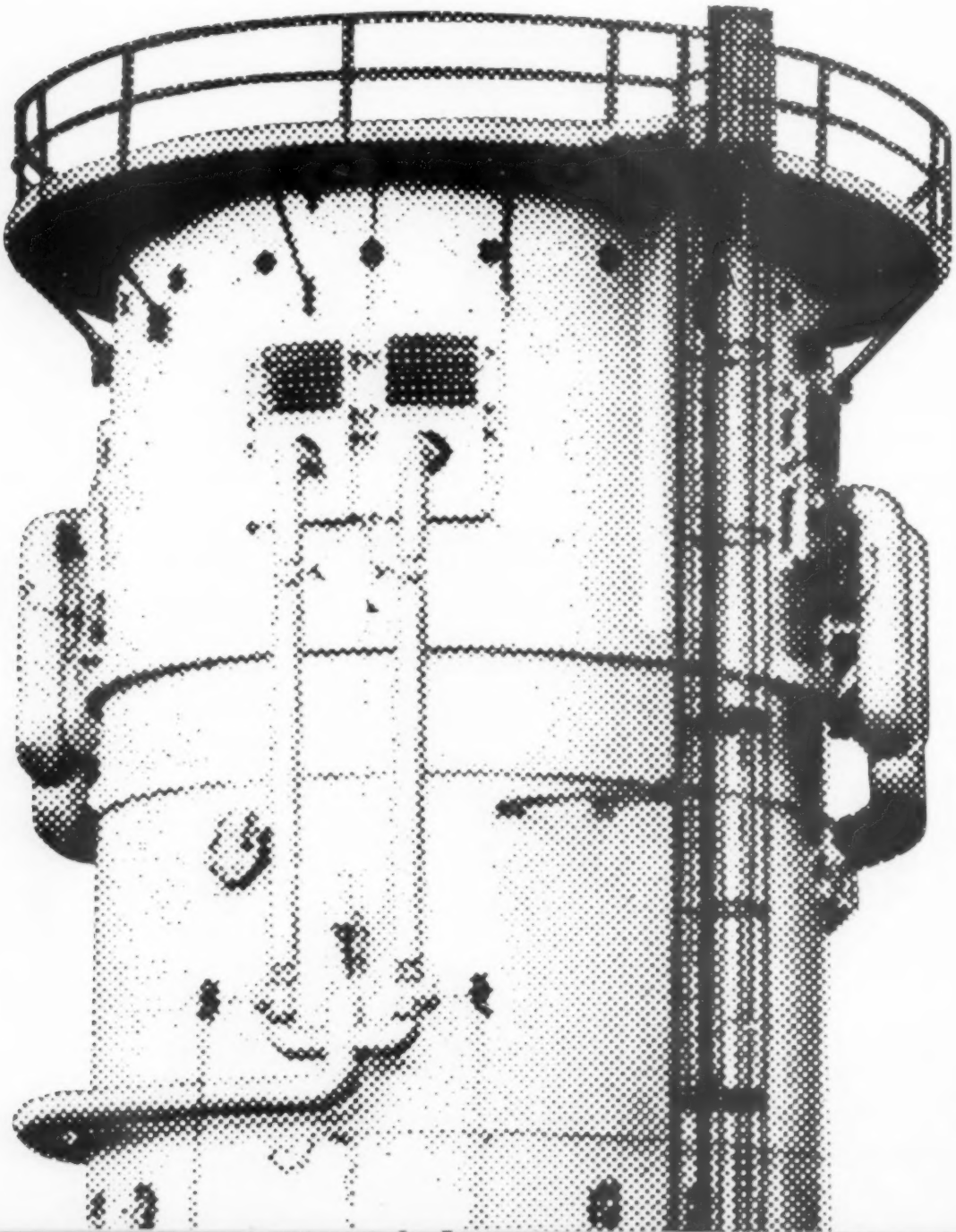
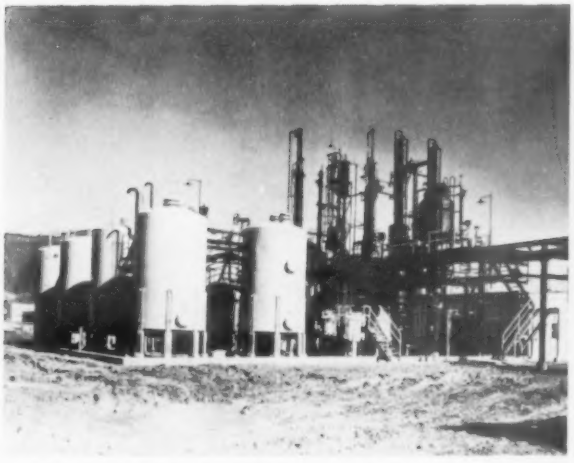
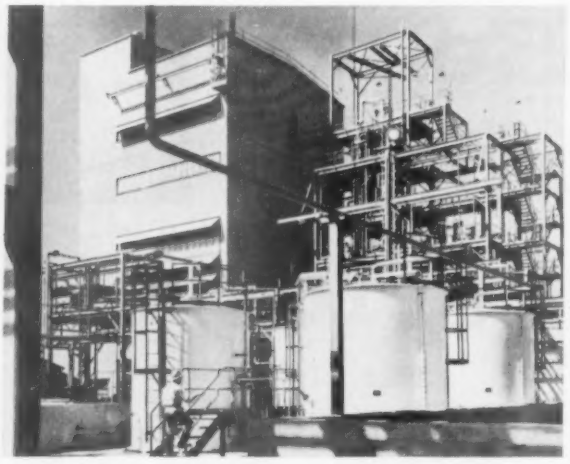




ACRYLIC ESTERS, for emulsion-type latex paints, are prepared in this plant by Union Carbide Chemicals Co.



EPOXY COATINGS have become so popular that Shell Chemical Co. tripled production of its Houston plant.

Paint Industry, Growing More Complex, Has a Double Impact on Refiners

- **Refineries and petrochemical plants are the paint industry's most exacting customers.**
- **They have also become its main suppliers. Most of the raw materials used to make paints today come from petroleum. And the trend grows constantly.**

The refiner, long one of the paint industry's major customers, has now become its principal supplier as well.

Today, the largest proportion of the ingredients from which paints and coatings are made is of petrochemical origin.

They are an almost endless, and often confusing, variety.

Proper maintenance of a refinery requires many types of paints and protective coatings, with widely varied properties.

Constant exposure to sun and weather in every climate, in many cases exposure to high temperatures, and the need to resist scaling, corrosion, and discoloration for long periods between turnarounds or extensive repainting programs, result in rigid specifications for the paints and coatings used in the oil refineries.

These requirements can be met today by making an ever-increasing use in the manufacture of paints of the very products made in these refineries.

For many years, the only refinery products used in making paints were solvents.

Hydrocarbon solvents replaced turpentine in the '20s. Shortly thereafter, petroleum-derived methyl-ethyl-ketone started to replace the methyl-ethyl-ketone derived from wood alcohol.

Every oil company began to make from one to as many as 100 varieties of aliphatic "mineral spirits," V.M.&P. (varnish makers' and painters) naphtha, and aromatic solvents, such as xylene. Shell Oil Co., for example, today makes 19 basic paint solvents —and about 75 variations of these for specific customers.

Petroleum has captured an increasing share of the paint-solvent market in recent years, due primarily to the development of odorless oil-based solvents.

The joker in such a development, however, is that, in order to make a solvent odorless, some of the hydrocarbons that have the most potent solvency must be removed. A careful evaluation of the properties of each component in a solvent must therefore be made to develop a product that is:

- High in solvency;
- Reasonably odorless;
- Safe from fire and toxic fume hazard;
- Satisfactorily volatile.

Odorless solvents today are made by many companies; among them are Atlantic, Mobil, Phillips, Richfield, Shell, and Sinclair.

Nitroparaffins and oxygenated solvents are among the latest entrants in this field.

Today, the petroleum industry's role as a paint industry supplier goes far beyond solvents. Most of the oils, acids, additives, and resins used by paint manufacturers are made from petroleum.

By far the greatest changes, over the years, have been in the vehicle portion of the paints.

Vegetable oils, nitrocellulose, and casein, used as vehicles and film-forming elements in paints, have gradually given way to stronger, quicker-drying products of petroleum origin.

However, one of the oldest, linseed oil has not been replaced. It is still very much in use for outdoor house-paints. "In fact," says J. D. Rode, product manager for DuPont's industrial maintenance finishes, "it seems that none

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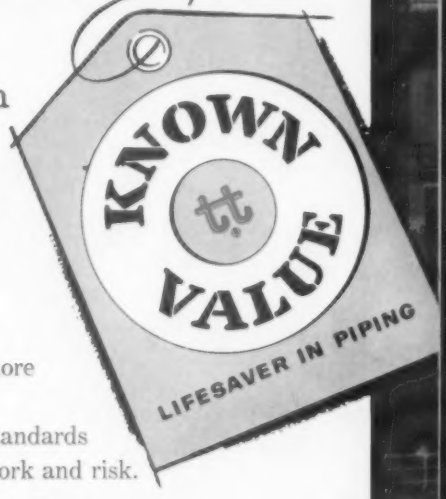

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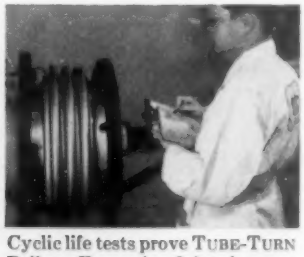

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of the old vehicles are ever replaced; the paint manufacturers just add new ones, and the consumer's job of choosing coatings becomes more and more difficult."

Broadly speaking, paints can be classified today in two main categories, solvent-type and water-emulsion, or latex, type. In the first category, the alkyds lead the field by a wide margin.

Alkyd paints are made with polyester resins, modified with a vegetable acid oil, such as castor, soybean, linseed, or tall oil.

The present popularity of alkyd paints explains in part why so many new plants are being built for the production of phthalic and maleic anhydride and isophthalic acid. The reaction of these dibasic acids with a polyfunctional alcohol—such as glycerine, pentaerythritol, or ethylene glycol—produces the polyester resins used for alkyd paints.

"It has been estimated," says Rode, "that 85% to 90% of all paintable surfaces in the processing industries, including petroleum refineries and transportation and marketing equipment, can be satisfactorily protected with alkyds."

"Alkyds," says R. M. Koppenhoefer, executive vice-president of Socony Paint Products Co., an operation of Mobil Chemical Co., "are still the work horse of the paint industry."

The chief objection to alkyd paints is their lack of resistance to alkalis. To overcome that objection in part, alkyd coatings are sometimes reinforced with another type of petrochemical resin, such as the ureas or melamines.

Another popular solvent-type paint with extremely high resistance, especially to inorganic chemicals, is vinyl. Both the polyvinyl chloride and the polyvinyl acetate varieties are used.

The alkali resistance of the vinyls is equal to that of the best catalyzed epoxies. They are best applied with

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SEE KEN'S SECTION IN COMPOSITE CATALOG FOR OTHER PRODUCTS

One-Coat Paint Is Nearly 100% Solids

A protective coating that can do the job in a single application has been developed for maintenance applications in refineries and chemical plants. It is nearly 100% solids, according to its manufacturer, E. I. du Pont de Nemours & Co.

The periodic repainting of big units, such as storage tanks, towers, and reactors, is always an expensive operation, essentially from the labor standpoint. It generally takes several successive applications to cover the surfaces adequately.

At the 17th annual conference and show of the National Assn. of Corrosion Engineers, in Buffalo recently, Du Pont unveiled, a new type of paint, still in its development stage, that will do the job with one coat.

These high-solids paints, which come in both primer and topcoating grades, are single-package finishes. The vehicle, which is covered by patent applications, is based on completely new chemistry, Du Pont says, and is unlike anything previously offered commercially.

The basic raw materials are of petrochemical origin. The paint as received is ready for application by conventional spray, brush, or roller.

spray equipment. As an example, the gates of the St. Lawrence Waterway have been vinyl-coated.

Unfortunately, vinyls also have disadvantages. For one thing, they become thermoplastic at 150F, and most of them are unsuitable above that temperature. In addition, they contain a low percentage of solids by volume, so that as many as six to eight coats may be required for satisfactory film thickness. This makes vinyl coatings quite expensive from a labor standpoint.

Modifications, in the form of a filler-reinforced vinyl mastic, have been prepared to increase vinyls' viscosity and improve their build per coat.

Among the solvent-type coatings, the phenolics—one of the earliest synthetic resins—have shown little growth in recent years.

These paints, produced by the reaction of phenol and formaldehyde, followed by cooking with some vegetable oil, are losing ground to the stiff competition of newer, more rugged types of coatings.

The second category of paints, the water-emulsion type, is growing in popularity for many reasons. In that category are the styrene-butadiene latex, the polyvinyl acetate emulsions, and the acrylics.

Water-emulsion paints, for both interior and exterior applications, have been on the market for only a few years, and their popularity is growing fast. Among the reasons:

- They are odorless and very safe.
- They dry rapidly—usually in less than an hour.
- They are easy to apply, and thus have great appeal for the do-it-yourself trade.

Sherwin Williams Co. foresees an enormous trade sales market for latex paints, and expects water-emulsion coatings to make good in the automobile industry as well.

Styrene-butadiene copolymer, used in water emulsions since 1945, was closely followed by polyvinyl acetate emulsions—the reaction product of acetylene and acetic acid. A PVA latex produced by Celanese Corp. of America is making progress as a primer for metals.

Present trends appear to indicate that high-quality latex paints of the future will be made with acrylic resins—such as methyl methacrylate, ethyl acrylate, and acrylonitrile.

They make excellent low-gloss interior and exterior paints for masonry, plaster, and properly primed wood surfaces.

At the meeting of the American Chemical Society in St. Louis last week, Donald E. Field, of the U.S. Naval Research Laboratory, reported the successful use of a newly developed acrylic latex coating for interior painting of nuclear submarines.

"One of the major factors limiting the submergence period of nuclear submarines," Field explained, "has been atmospheric contamination. A primary source of such contamination is commercial paint, which, through gradual release of fumes over an extended period of time, can pollute the air. Extended drying periods that can keep ships out of action in an emergency are eliminated by the new paint formulation, which dries in 20 minutes."

Also last week, Du Pont started distributing commercially a new acrylic emulsion wall paint, which is the latest version of its Lucite acrylic finishes.

Acrylic polymer resins were first developed before World War II, under the name of Lucite and Plexiglas, by Du Pont and Rohm & Haas Co., respectively. Later, Dow Chemical Co. and Monsanto Chemical Co. joined the ranks of those interested in this work.

As a result of these studies, Rohm & Haas has developed two acrylic emulsion resins, Rhoplex AV-33 for interior applications, and Rhoplex AC-55 for exterior use.

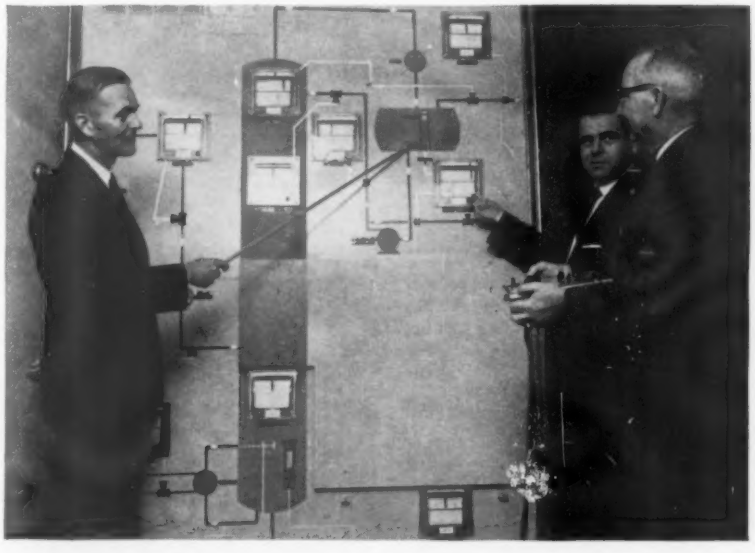
The new Lucite wall paint, Du Pont told PETROLEUM WEEK, owes many of its advantages to a property known as thixotropy, or thinning by shear. It is a property which reduces a paint to a free-flowing liquid when the normal motion of a brush or a roller is introduced, and lets it revert to a mayonnaise-like consistency as soon as the motion is stopped. Thus, a thixotropic paint will not drip, spatter, or run down the handle of a brush.

When it is used in combination with a blister-resistant primer, moisture is allowed to breathe through the film, while water penetration from the outside is shut out.

Other petrochemicals, which cannot be called either solution or emulsion-type products are making rapid progress as coating materials.

Among these are the epoxies and the polyurethanes. They can be formulated in so many different ways that it would be difficult to assign them to any specific category.

Epoxy resins are taking an increasingly large share of the paint and



Training Panels Simulate Equipment

Models simulating refinery process units are being used to train and to improve the efficiency of operators by Mobil Oil Co. and Mobil International Oil Co. The panels are being constructed by Carmody Corp., Buffalo.

One set of panel trainers, which simulates Thermofor cat cracking, is being currently used on a rotational basis throughout the Mobil Oil Co. refineries.

Here, R. N. Rouse, Jr., assistant to the training superintendent of the new Mersin (Turkey) refinery now under construction, shows how one of the models simulates the operation of a fractionating tower, to H. D. Sherwood and D. C. Seely, both of Socony Mobil's engineering department.

coating market. They are expected to take over second place, immediately following the alkyds, because of their high resistance to chemical attack.

To make useful maintenance paints, epoxy resins must either be catalyzed or further esterified with drying acids. Amines or polyamide resins are used as catalysts. The esterified epoxies are single-package coatings, therefore simpler to apply than the catalyzed products. They behave like good alkyd coatings.

The most recent addition to the variety of available coatings and paints are the urethanes.

They are supplied either in the two-package or the one-package type, and the latter can be classified into heat-cured, moisture-cured, or air-cured.

Urethane paints, manufacturers say, should find applications in the petroleum industry as floor coatings of extreme hardness, as solvent and abrasion-resistant coatings, and perhaps as interior coatings for fuel storage tanks.

The use of polyurethane paints tripled in 1960 over 1959, according to Union Carbide Chemicals Co.

Other elastomers are also used as paints to a limited extent. They include chlorinated rubbers, such as Enjay Chemical Co.'s chlorinated butyl rubber (PW—Dec.23'60,p28), Neoprene, Hypalon, and Thiokol.

Last but not least, the oil industry supplies the paint industry with products that are further processed into useful additives. They are used for such purposes as driers, antiskinning agents, plasticizers, and antimildew additives.

Certain organic color pigments are also of petroleum origin.

Fast Jets Won't Change the Fuel Picture

A significantly greater demand for jet fuel will arise when world air traffic starts to move at supersonic speeds, rather than by today's subsonic jet aircraft.

At a symposium on "Fuels for the Sixties," held by the Society of Automotive Engineers in New York recently, W. G. Dukek, of Esso Research & Engineering Co., analyzed the economics of supersonic jets for airlines and military purposes, and their impact on the fuel situation.

The advantage of the supersonic jet is basically that it can fly three times as fast as the present jet—at a cruising speed of about 2,000 mph.

The fuel consumption of these supersonic planes will be high: They would consume about 60% more than conventional jets in moving the same amount of ton-miles. Their fuel cost would represent about 50% of the aircraft operating cost, instead of today's 30% for subsonic jets.

By 1975, it is estimated, an additional 300,000 b/d of jet fuel will be required for Free World airlines, over and above that which would be required the same year if the same traffic moved by subsonic aircraft.

This, Dukek said, is an incentive for refiners to create a fuel that will satisfy the demands of the new aircraft.

But the price of this fuel will have to be kept reasonable.

Because of the extreme dependence of profits on fuel costs, the incentive for the airlines to buy and operate supersonic jet aircraft would disappear if the price of supersonic jet fuel were more than 10% higher than the cost of regular jet fuel, Dukek pointed out.

Supersonic fuel will have to be tailored to possess special quality features. The most important requirements are thermal stability and low volatility.

Free World Demand for Major Petroleum Products

(Percent of total demand)

	1960			1967		
	U.S.	Foreign	Total Free World	U.S.	Foreign	Total Free World
Gasolines	42.4%	23.0%	33.1%	44.4%	21.8%	32.6%
Jet Fuels*	3.8	2.2	3.0	5.2	3.2	4.2
Distillates	21.6	25.8	24.3	19.4	26.5	23.2
Residuals	16.5	37.5	26.4	15.1	37.8	26.8
Other	15.7	11.5	13.2	15.9	10.7	13.2

*About half are gasoline components, half kerosine components

Data: Esso Research & Engineering Co.

In supersonic flight, fuel would be subject to increasingly high temperatures, not only in the wing and fuselage tanks, but by heat absorption from the airframe and the engine. This requires low volatility, to minimize the use of heavy pressure tanks, and a high thermal stability, to avoid formation of deposits.

The volatility requirements will not affect the cost significantly, Dukek said, since the demand for this fuel would still be small relative to the demand for total petroleum products.

And a judicious combination of feedstock selection, processing methods, and use of additives should make it possible to give to a fuel a satisfactory thermal stability at reasonable cost, he predicted.

Other important qualities required for a supersonic fuel are a high energy content per pound and a high luminometer number.

All these qualities are related to fuel composition, and are interdependent: Processes that will improve the luminometer rating, or increase the Btu. per lb., are apt to improve thermal stability as well. Naphthenic fuels, for example, are a good compromise between the requirements for high energy content and the need for high density.

"One of the best compromise fuels," Dukek said, "in terms of volatility, density, and paraffinicity—the latter favoring a good luminometer number—is an ASTM Type A commercial kerosine, such as is currently marketed for subsonic jets, with the added feature of thermal stability."

Supersonic fuel must be handled under superclean conditions to avoid contamination that would jeopardize its thermal stability.

"Supersonic fuel must be handled with pharmaceutical cleanliness," is how Dukek puts it. This may require a costly filter-separator cleaning operation. But if a single central fuel-processing system were used for all aircraft—subsonic and supersonic—Dukek suggested, the cost of superior fuel-handling might be offset by savings in avoiding a segregated system.

In order to help keep down the

price of fuel, it may be necessary for the aircraft manufacturers to make certain compromises in the design of their supersonic jets. For example:

- Insulation of tanks and use of ram air coolers would reduce severity of the thermal-stability requirements.
- Use of an engine lubricant with higher bulk temperature resistance would allow this lubricant to share the cooling load carried by the fuel.
- Installation of an extensive inerting system—inert gas atmosphere—may, in addition to reducing the possibility of spontaneous ignition, reduce oxidation reactions of the fuel vapors.

Supersonic fuel demand in 1967 will not be particularly critical from the standpoint of over-all availability.

A shift of 1% to 2% in the demand from gasoline to distillate, or vice versa, would not greatly upset the general demand pattern in the Free World, Dukek predicted (table).

But the distribution pattern in the Eastern and the Western Hemispheres would be quite different.

Good paraffinic fuels, with high luminometer numbers, can be obtained from crudes predominating in the Middle East, North Africa, and Indonesia. The construction of refineries in the Eastern hemisphere for processing these crudes will take care of the European demand, the second largest market for supersonic fuels.

The U.S., which will still be the most important market for supersonic fuels in 1967, will have to make them primarily out of naphthenic crudes, from domestic production, the Caribbean, and South America.

Oxygen, Nitrogen Made Outside Plant May Be Cheaper

Petrochemical plants which need large quantities of oxygen and nitrogen can often get them cheaper by buying them next door than by making them themselves. The trend is towards the "over-the-fence" plant.

Most on-site air-separation plants serve a single consumer and are generally installed on his own property. But the over-the-fence plant is built and operated by a supplier, on land adjacent to a principal consumer's property. In addition to supplying that consumer, it sells to other customers in the area the amounts of products over and above the quantity required by the principal consumer.

The over-the-fence separation plant

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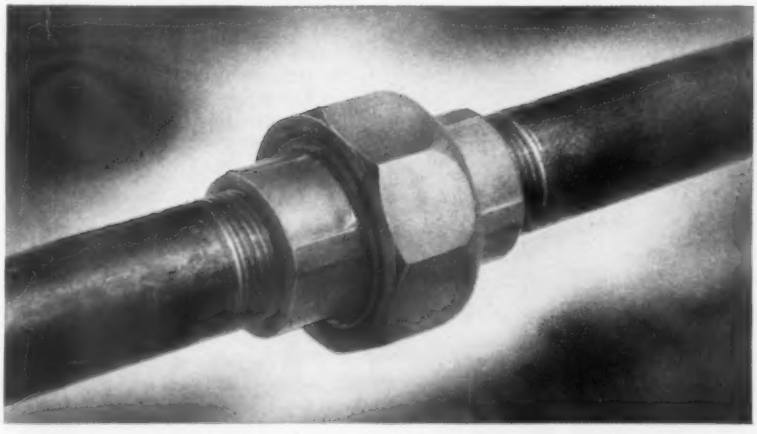
You can SEE the difference on the shelf



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offers many advantages to users of oxygen and nitrogen. For example:

- The consumer needs to invest no capital for the construction of an air-separation plant of his own.
- The gases are generally available at a lower cost than would be possible in an individual plant because they are produced in larger quantities.
- Should the requirements of any consumer increase, further quantities of gases are easily available, because the operator of the over-the-fence separation plant generally has access to a large group of other similar units.
- For the same reason, consumers are not crippled in case of an unavoidable shutdown of the local separation unit.
- A consumer of only one of the two main gases separated, oxygen and nitrogen, is not penalized by wasting the other gas.

Latest example of over-the-fence air separation plants is that which Air Reduction Sales Co. has now under construction at Claymont, Del., to supply oxygen and nitrogen to SunOlin Chemical Co.'s adjacent new plant.

SunOlin will use initially 350 tons a day of oxygen and 25 tons of high-purity nitrogen.

Pure oxygen refers to a purity of better than 99.5%, and pure nitrogen to nitrogen containing less than 50 parts per million of impurities.

Gases separated from the air—oxygen and nitrogen—are used for the manufacture of many products. They are essential starting materials for the making of ammonia, acetylene, ethylene, oxidation products from propane and/or butane, and for methanol synthesis.

Less than 25% of the tonnage required today is sold by the over-the-fence method, but more and more customers are joining the new trend, Air Reduction says. Obviously, the selection of the most economical method is essentially a matter of geography.

What's New / IN PROCESSING

Construction of the new petrochemical complex of Monochem, Inc., will start next month at Geismar, La.

Monochem is a newly incorporated company jointly owned by Borden Co. and U.S. Rubber Co. It will manufacture acetylene and vinyl chloride monomer, using natural gas as raw material.

Initial production is to be 80-million lb. of acetylene and 150-million lb. of vinyl monomer per year. These products will be converted further, both in other plants which the two companies operate at present, and in new plants they plan to build.

•

Goodrich-Gulf Chemicals, Inc., Cleveland, has granted its second license for the manufacture and sale of certain synthetic rubbers, to Shell Chemical Co., Ltd. Polymer Corp., Ltd., of Canada was granted a Goodrich-Gulf license to produce stereo specific rubbers a short time ago (PW—Mar.17'61,p40).

Shell already has licenses under patents held by Karl Ziegler of Germany to use his catalysts to manufacture polybutadiene and polyisoprene in the United Kingdom. The firm can now use Goodrich-Gulf patents also.

Quantum, Inc., Wallingford, Conn., will study the possibilities of using copper compounds as additives for gasoline.

Quantum's $42,000 project is part of a program aimed at finding new applications to make use of the catalytic properties of copper, sponsored by the Copper Products Development Assn., New York.

•

A pilot plant for the manufacture of high-energy nitro-aromatic explosives is now in operation at the Asheville, (N.C.) plant of Amcel Propulsion, Inc., subsidiary of Celanese Corp. of America.

The plant will be used to manufacture compounds that exhibit more advantageous characteristics than common explosives, Amcel says.

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Correction

Shell Oil Co. of Canada will not build a refinery in Trafalgar Township, Ont., although it has owned a plant site there for several years. The property was purchased for future plant development in the Toronto-Hamilton area, Shell says.

PETROLEUM WEEK'S Fingertip Figures

The distillates position improved considerably last week. A spurt in demand trimmed stocks by 4.5-million bbl. Demand averaged 2,763,000 b/d, or 439,000 b/d higher than the previous week. This is the strongest showing since late February.

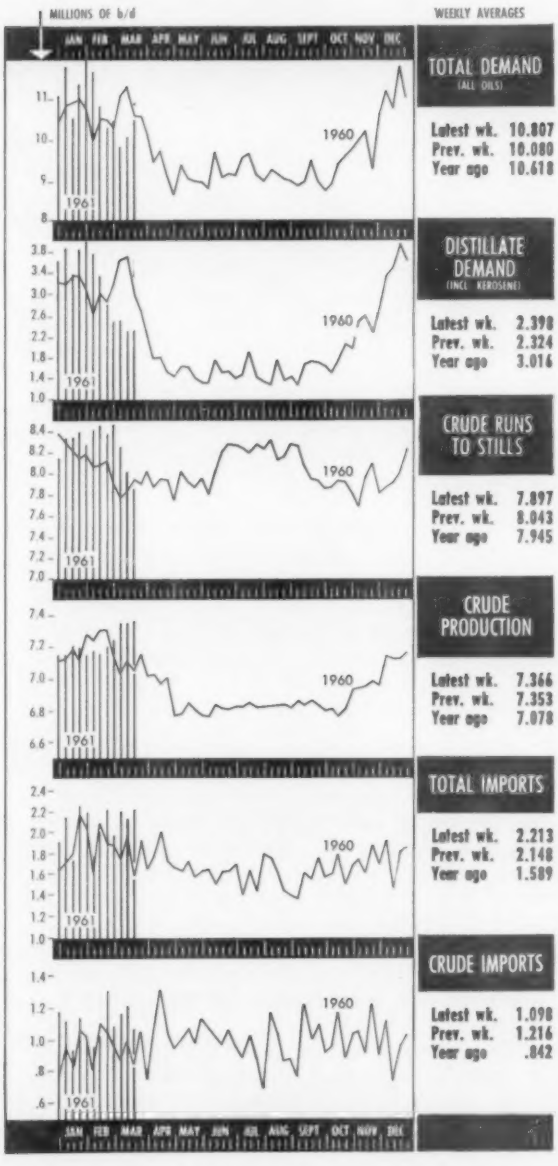
Inventories fell to 116.2-million bbl. from 120.6-million bbl. the week earlier.

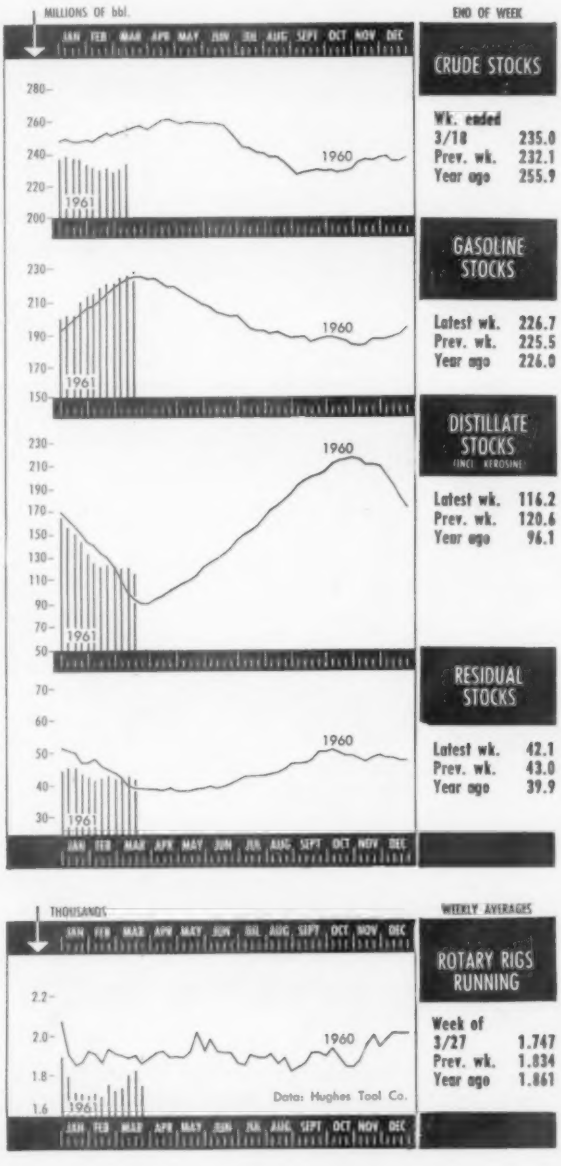
Gasoline fared well too, demandwise, although stocks are still climbing. There was a call for 4-million b/d of the product, and from the way it looks now, March could close with the highest gasoline demand for that month on record. Inventories, however, nudged up another 1.1-million bbl. to 226.7-million bbl.

Another rash of cutbacks by refiners brought long-awaited results: Runs are now under 8-million b/d, and below the year-ago level.

Crude runs to stills last week averaged 7,897,000 b/d—that's 146,000 b/d under the previous week and 48,000 b/d less than a year earlier.

All figures below are for the week ended Mar. 24 unless otherwise noted.





Company Developments

Oklahoma Natural Gas Co. has set up a wholly owned subsidiary to sell natural gas in interstate commerce.

Oklahoma Natural Gas Gathering Corp. will deliver some 37-million cf/d of gas from Ringwood field, Major County, to Cities Service Gas Co. Federal Power Commission approval will be sought. The parent firm will remain an intrastate company, subject to the jurisdiction of the Oklahoma Corporation Commission.

•

Geosonic Corp. is the new name of Research Exploration, Inc. The Houston firm's name change results from a merger with Exploration Associates, Triton Drilling Co., Rex Drilling Co., and Electronic Systems. Geosonic will have four operating divisions—geophysical exploration, rotary drilling, applied research, and electronic systems manufacturing.

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Jones & Laughlin Supply Division will distribute hydraulic subsurface pumps made by Johnson-Fagg Pump Co., Tulsa. A service facility has been set up at J&L's Lindsay (Okla.) supply store. Others will follow.

•

Expansions

Magnet Cove Barium Corp., one of the Dresser Industries, has installed a 125-ton silver-ore flotation plant at its barite mine in Walton, Nova Scotia. Core samples there indicate in excess of a half-million tons of lead-silver ore at the 950-ft. horizon. They have assayed from $32 to $40 a ton. Estimates of the deposit show there is enough lead and silver ore to maintain the concentrator at capacity for more than ten years.

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Black, Sivalls & Bryson, Inc., is opening a new glass fiber products plant at Ardmore, Okla. The plant includes machines incorporating techniques for filament winding of large-diameter tanks and allied products specifically developed for this facility.

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Union Carbide Canada's Visking division will build a new plant in Newton, B. C., to make polyethylene film. The company has already purchased a site. The plant, when built, will be the division's third new production facility since 1958, and its fourth polyethylene film plant in Canada.

•

Acquisitions

Lear, Inc., Santa Monica, Calif., is negotiating to buy Sprague Engineering Corp., of Gardena.

The proposal would involve an exchange of 6/10th of 1 share of Lear stock for each Sprague share. The latter company's product line includes electrical power supplies, hydraulic accumulators, valves, and fuel pump and accessory equipment test stands.

•

Founders Corp., New York, has bought approximately 25% of Macmillan Petroleum Corp., Los Angeles. The New York investing company has purchased the 259,292 shares held by the R. S. Macmillan family. Macmillan specializes in refining and marketing of asphalt and lube oil products.

•

Overseas

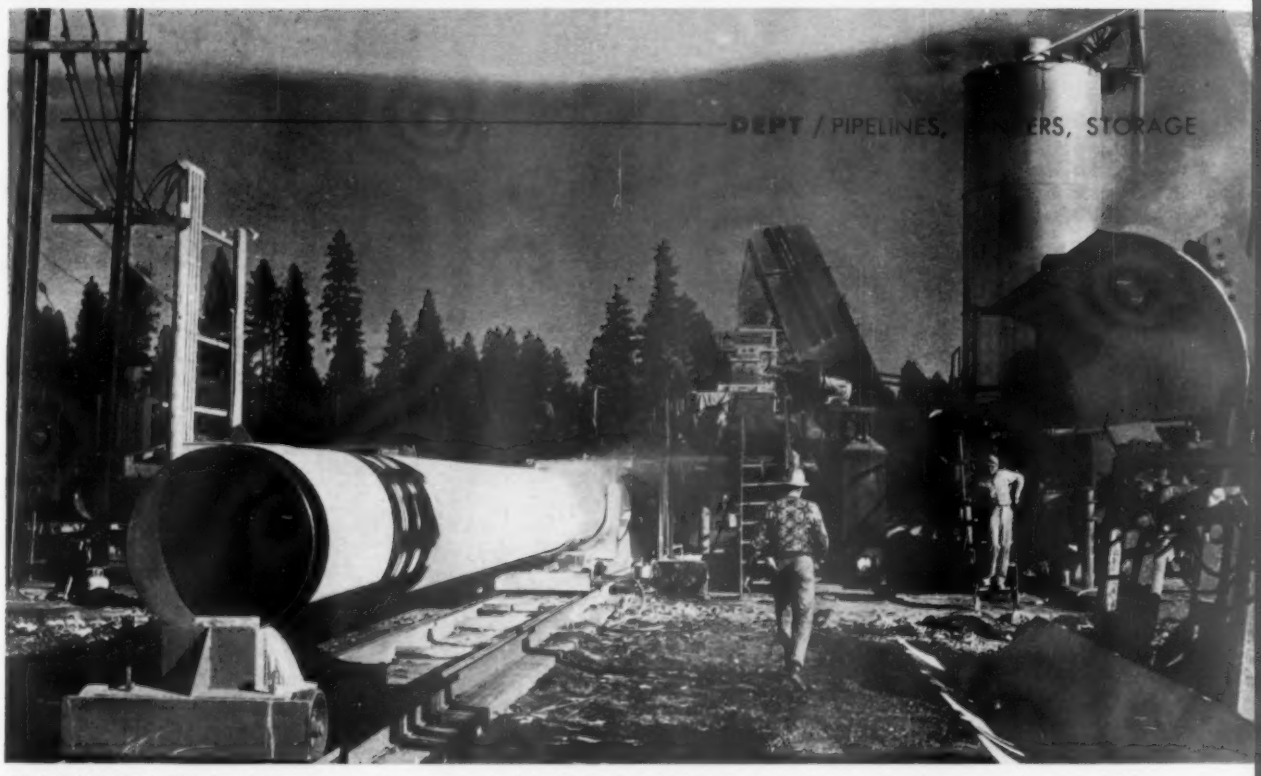
An affiliate of Badger Manufacturing Co. will build a $12-million specialty rubber plant in Strasbourg, France, for Polymer Corp. (SAF). Badger (France), Paris, expects to start construction this summer, with completion scheduled for the third quarter of 1962. The 10,000-ton-per-year plant will help meet growing demand in Common Market countries.

•

Refinery, chemical, and gas pipeline expansion programs in Europe have prompted Burgess-Manning Co., Dallas, to form a foreign subsidiary—Burgess-Manning International S.A. The subsidiary will be headquartered in Paris.

Burgess-Manning, which is in the field of silencing and pressure piping pulsation control, has been active in Europe for more than two years.

The company has an established distribution system in Germany, Italy, France, Holland, Switzerland, Spain, Portugal, and Austria.



COATING OF PIPE for U.S. portion of new gas pipeline from Canada is done at yards such as this one at Burney, Calif.

Manpower Costs Cut on Pipeline Job

Double-jointing of pipe in yards along the route of the U.S. section of the gas pipeline from Canada is boosting worker productivity and cutting labor costs.

The method of joining the 40-ft. sections of pipe into 80-ft. sections is being employed on the entire length of the 905 mi. of 36-in. line in the U.S. The technique is also being used on parts of the line in Canada.

One yard crew of 25 men is welding between 80 and 120 joints a day, compared with 60 joints that could be expected from the same number of men in the field, according to Pacific Gas & Electric Co., who will own the line.

The yard is at Burney, Calif. There is another yard in California at Napa. In addition, there are yards at Sprague River, Gilchrist, Madras, Condon, and Hinkle, in Oregon; at Winona and Elwood, Wash.; at Hauser and Sandpoint, Idaho; and at Yahk and Elko, British Columbia.

Joints are welded with an automatic submerged arc unit developed by H. C. Price Co., which has two spreads on the line. The automatic nature of the unit accounts for the greater speed of welding (photo, right).

The same process is being used at the other yards on the line.

The welding arc in the yard unit is stationary, and the pipe spins on rollers.

Field welding would be much slower, since the welders must scramble over, under, and around the pipe.

Other advantages in the yard-welding operation, according to Pacific Gas & Electric, are that supplies are handier and work can proceed uninterrupted in bad weather.

Labor-cost savings result from the fact that a yard crew is composed of both welders and less skilled workers, while a field crew consists entirely of welders.

All field people must be welders, Pacific Gas & Electric says, but in the yard crewmen of other trades can be employed as peripheral workers. It adds that, since these other workers are paid less than welders, the savings mount up.

Though double-jointing is undoubtedly speeding construction of the line, time-saving is not a primary concern.

In fact, a spokesman for Pacific Gas & Electric says, "Let's not put it in terms of weeks and months saved."

He adds that the fact that double-jointing eliminates half the welds that would have to be made in the field if 40-ft. sections were strung does not mean that the job time is cut by 50%.

DOUBLE JOINTING of pipe is done at yards with automatic welding units.

The saving in construction time is more on the order of 30%, he points out. The reason is that, with half the welding being done in the yards, the crews in the fields have been reduced in numbers.

Most of the pipe is also being

coated at the yards, which, like the double-jointing, is a relatively new pipelining technique. This measure is not aimed at paring costs or job time, but rather at tightening quality control.

Pacific Gas & Electric engineers say that, while yard-coating does cut costs and time, the savings are negligible.

Price is using its trademarked Somastic method in coating the pipe for the California spread. This process consists of combining asphalt, graded sand, asbestos fiber, and lime into a single substance, which is extruded in a ½-in. layer on the pipe. Because the Somastic coating is considered better than another coating being applied on other sections of the line, it is also being used on pipe at all river crossings.

The other coating consists of layers of the following materials: asphalt-based primer paint, asphalt enamel, fiberglass-based paper, asphalt-based paint, and finally rag felt paper. It is being applied on the line where conditions do not warrant the use of the more expensive Somastic.

Contract on the spread between the two Price spreads is the joint venture of Western Pipeline, Inc., Austin, and J. P. Neill & Co., Dallas.

The line is scheduled to be in operation next winter.

It is expected to deliver an average of 414-million cf/d in its first year of operation, and 800-million cf/d in five to ten years.

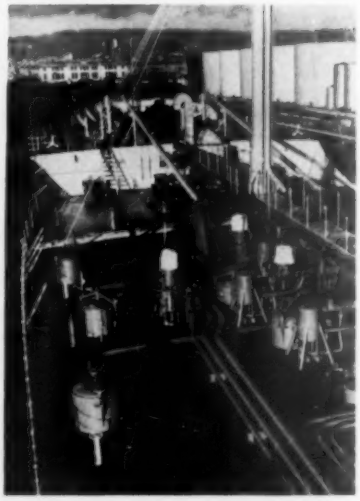
This was the status of construction last week:

On the California section: 66 mi. graded, 59 mi. trenched, 44 mi. installed, 154 mi. of pipe received, 107 mi. double-jointed, 69 mi. wrapped.

On the section through Oregon, Washington, and Idaho: 285 mi. graded, 22 mi. trenched, 18 mi. installed, 216 mi. double-jointed, 202 mi. wrapped.

Dow Chemical Adds Tanker to Fleet

The 18,000-ton tanker S. S. Leland I. Doan, chartered to Dow Chemical Co., unloads petrochemicals at McGuire Chemical Co.'s Oakland (Calif.) terminal, after a maiden voyage from Dow's Freeport (Tex.) plant. Dow says the addition of the Doan to the two tankers it had in operation will enable it to ship by water more than 600,000 tons of chemicals annually. It adds that shipments such as the one to McGuire—because they are cheaper than rail—could contribute greatly to the growth of the West's chemical industry. The S. S. Doan, designed against contamination and corrosion, is equipped with four sets of nickel-coated steel tanks, coiled and insulated for handling petrochemicals with high-purity standards, the company says. The vessel also has a plastic-lined tank for special high-quality glycols.



What's New
IN TRANSPORTATION

Natural Gas Pipeline Co. of America is seeking authority to spend $52.3-million for new facilities to boost total capacity of its system by 160-million cf/d to 1.6-billion cf/d.

The Federal Power Commission will hold a hearing on the proposal Apr. 18.

The project involves the construction of 285 mi. of 30-in. loops, 60 mi. of 36-in. loops, 22.5 mi. of 8-in. laterals, compressor facilities to boost station output by 64,200 hp., and installation of five meter stations and appurtenant equipment.

The new facilities would be built in Illinois, Texas, Arkansas, Kansas, Nebraska, Iowa, and Missouri.

The additional gas would go to 17 existing customers in Illinois, Indiana, Iowa, Wisconsin, and Oklahoma.

Consolidated with Natural Gas's plan at the hearing will be applications by Texaco Seaboard, Inc., Texaco Inc., and Humble Oil & Refining Co. to supply the gas from five Texas counties.

Texaco Seaboard and Texaco Inc. propose initial prices of 18.5¢ per Mcf. for sales in Railroad Commission District 4; Humble proposes an initial price of 20¢ per Mcf. for sales in District 3.

•

Service Pipe Line Co. will loop its crude trunk line that runs from LaPlata, Mo., to Wood River, Ill., to increase its capacity by 20,000 b/d.

Present capacity of the 250-mi. line is 77,000 b/d.

Crude moved through the line comes from New Mexico, Oklahoma, Kansas, Colorado, Nebraska, Wyoming, and Texas.

The 60 mi. of 12-in. loops will be built for Service by River Construction Corp., Ft. Worth.

•

H. C. Price Co., Bartlesville, has been awarded a contract to build two loops on Texas Eastern Transmission Corp.'s gas pipeline in New Jersey.

One loop of 30-in. diameter will run 2.9 mi. from the east bank of the Delaware River to a point near Lambertville.

The other loop, which will be 36-in., will extend 23.5 mi. from Lambertville to near New Brunswick.

Equipment and men are now being moved into the area, and pipelaying is expected to start in May.

W. P. CARVER has joined Great Basins Petroleum Co., Los Angeles, as vice-president and a director. He was formerly division landman for Mobil Oil Co.'s western division, and was manager of the land department of General Petroleum Co. before it was merged into Mobil.

W. P. Carver

J. C. Quilty

JOHN C. QUILTY has been appointed to the newly created position of general manager of Shell Oil Co.'s personnel and industrial relations organization, with offices in New York. Quilty, who joined Shell in 1934 as an attorney at Tulsa, was appointed manager of the legal department of the eastern exploration and production area in 1940. Two years later, he moved to New York as assistant to the president, and in 1943 joined the personnel department. Later that year he became manager of the industrial relations department, his most recent position.

O. L. FURSE has been named regional production manager, and **E. A. MURCHISON, JR.**, regional exploration manager, for the new southeast region of Humble Oil & Refining Co., with headquarters in New Orleans. Furse was formerly eastern area production manager for the Humble division, and Murchison was the division's eastern area exploration manager. **E. M. Jolly**, who has been serving as manager of the Tennessee-Arkansas area of the Esso Standard division, will be regional marketing manager for Humble's new southeast region, and **C. N. Bailey**, who was formerly assistant controller for the Humble division, has been appointed regional controller of the new region. Other new members of the southeast region's staff are: **William Grant, Jr.**, formerly assistant manager of the Humble division's employee relations department, now regional employee relations manager; **Charles Janvier**, formerly attorney for the eastern area of the Humble division, now regional general counsel; and **A. F. Kent**, formerly information division head in the Esso Standard division's public relations department, now regional public relations manager.

CHARLES SKJOD, Amerada Petroleum Corp., has been elected president of the Dakota Petroleum Club for the 1961-1962 term. Other officers are: **Jerry Kennedy**, Deister, Ward & Witcher, vice-president; **Frank Alexander**, Texaco Inc., secretary; and **T. F. Keating**, Mobil Oil Co., treasurer. New directors are **Willard Burton**, California Oil Co.; **Clyde W. Jones**, an independent; and **Steven H. Harris**, consulting geologist.

FRANK P. PETERSON, president of Southern Minerals Corp. and Southern Pipe Line Corp., has been elected chief executive officer. He succeeds **Maston Nixon**, former board chairman, who will remain with the companies as a director and consultant to Peterson.

E. DUER REEVES, a director and vice-president of Humble Oil & Refining Co., **FRED A. L. HOLLOWAY**, a vice-president of Humble, and **LOREN F. KAHLE**, transportation coordinator of Standard Oil Co. (N.J.), have been elected to the board of Esso Research & Engineering Co.

W. H. Nichols

J. L. Boros

WILLIAM H. NICHOLS and **JOHN L. BOROS** have been promoted to new positions in the supply division of the new supply and transportation department of Standard Oil Co. (Ohio). Nichols, formerly field supervisor in the crude oil purchases and sales department at Tulsa, transfers to Cleveland to become manager of the new crude oil supply section. Boros, who was section chief in the supply and distribution department, now becomes manager of the products supply section. He will continue to be located in Cleveland.

MILLARD E. STONE, vice-president in charge of employee and community relations for Sinclair Oil Corp., has been named to the Committee on Public Affairs of the American Petroleum Institute.

STANLEY E. JAROS has started a one-year rotational assignment at Esso Research & Engineering Co. as associate director of the process engineering division. Jaros has been with Esso Research since 1942. **Daniel S. Maisel** has been appointed acting head of the company's chemicals development division. He was formerly assistant director of the unit.

WILLIAM M. ALLEN has been elected to the board of Standard Oil Co. of California. He is president and a director of Boeing Airplane Co., Seattle.

RALPH H. McCOLLISTER has transferred to Enjay Chemical Co., New York, as manager of the project development division, a new position in the company's new projects department. McCollister was formerly head of the chemical technical service department at Humble Oil Refining Co.'s Baton Rouge (La). refinery. Enjay is a division of Humble.

R. H. McCollister

G. W. Robinson

G. W. ROBINSON has been promoted to engineering associate, the highest engineering classification in the technical division at Humble Oil & Refining Co.'s Baytown (Tex.) refinery. He has been given the new position of process design coordinator, responsible for coordination of process design of all major projects.

G. T. STROTHER, JR., is the new district production manager in Corpus Christi for Sunray Mid-Continent Oil Co., and **J. E. Klipp** succeeds him as central division engineer, at Oklahoma City. Strother succeeds **A. E. Meissner**, who was recently promoted to western division production manager, at Denver. **Myron Elliott** has been named district engineer at Oklahoma City, succeeding Klipp. Elliott was formerly field superintendent for Sunray Mid-Continent at Newhall, Calif. At the same time, **R. K. McIntyre** was named district office manager for Sunray Mid-Continent at Hobbs, N. M. McIntyre, formerly lead clerk at Abilene, succeeds **J. A. Towle**, who has resigned.

JOHN C. BAYLESS has joined Doeringsfield, Amuedo & Ivey, Denver consulting geologists, as manager of engineering geology operations.

S. L. WINDHAM has been appointed general manager of distribution properties for Houston Corp., St. Petersburg, Fla. He has been general superintendent of pipelines. **Eldon Rolfe**, chief engineer for Houston Texas Gas & Oil Corp., will assume the responsibilities of general superintendent of pipelines for Coastal Transmission Corp. and Houston Texas Gas, both affiliates of Houston Corp. **Jim Hoss**, chief engineer for Coastal Transmission, will also serve as chief engineer for Houston Texas Gas. **Talmadge Day**, chief accountant for Coastal Transmission, will become internal auditor for Houston Corp., and its subsidiaries.

K. K. Litman

C. W. Felker

R. E. Killion

L. T. Weber, Jr.

K. K. LITMAN is area manager of the newly created Louisiana Gulf Coast area of the Baroid Division, National Lead Co., with offices in New Orleans, and **C. W. FELKER** is assistant manager of the new area, with offices in Lafayette. **L. T. WEBER, JR.**, has been named sales manager for the area, in New Orleans, and **R. E. KILLION** succeeds him as manager of Baroid of Canada, Ltd., in Calgary. The Louisiana Gulf Coast area includes the Houma, New Orleans, Lake Charles, Lafayette, and Berwick districts. Litman has been manager of Baroid's East Louisiana Gulf Coast area, and Killion was district superintendent at Edinburg, Tex. **W. T. Sherman,** formerly sales representative for Baroid at Houston, becomes district superintendent of the Edinburg-McAllen district. At the same time, **W. D. Watson,** formerly assistant general sales manager at Houston, was appointed area manager of Baroid's West Texas area, with headquarters at Midland. **S. D. Wiginton, Jr.,** formerly West Texas area manager, has been transferred and appointed sales representative in Dallas. **W. C. Kellogg,** formerly assistant area manager at Lafayette, has been transferred to Houston as assistant area manager of Baroid's lower Texas Gulf Coast area.

JAMES W. WALKER is the new sales representative at Neptune Meter Co.'s office in Dallas. He will be responsible for servicing the company's industrial and petroleum meter accounts in Texas and Oklahoma. Walker has spent the last several years in the Texas-Oklahoma area, and is familiar with the equipment requirements of industry in this area.

DAVID J. GENT is in charge of Hardy-Griffin Engineering Corp.'s new district sales office in Dallas. Hardy-Griffin, a division of Atlas Bradford Co., Houston, is engaged in providing specialized tubing connections and modified couplings for the completion of high-pressure oil and gas wells. Gent was formerly production manager of the Conners Steel Division of H. K. Porter Co., in Birmingham, Ala., and before that was associated with Jones & Laughlin Steel Co., and was engaged in tubular good sales in the Southwest, with headquarters in Houston and Dallas.

A. H. Wooler

P. L. Myers

L. L. Payne

ARTHUR H. WOOLER, PARK L. MYERS, and **LYLE L. PAYNE,** assistant vice-presidents of Hughes Tool Co., Houston, have also been elected directors of the company. Myers, who joined the company in 1940 as a field salesman, became assistant vice-president sales, in 1959, and Payne, who has been with Hughes since 1930, was promoted to assistant vice-president, engineering, in 1952. Wooler joined Hughes in 1947 and has been assistant vice-president, manufacturing.

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ROSCOE O. HAMBRIC is marketing manager for Continental-Emsco Co.'s new marketing group, machinery and miscellaneous merchandise, and **ROBERT M. ERSKINE** is sales manager of the new group. Hambric, who joined C-E in 1946, was most recently merchandise manager, and Erskine, with the company since 1953, was formerly assistant manager of sales, nontubular. **Harry Hobbs, Jr.**, has been named merchandising manager, machinery and miscellaneous merchandise. He was formerly assistant general merchandise manager. Two new C-E divisions have also been set-up; they will be headed by **Carl N. Swanson**, director of purchasing, and **August O. Brochu**, director of transportation. Swanson has been in the purchasing field since he joined C-E in 1916, and Brochu started with the company in 1947 in the traffic department. C-E's new marketing group and new divisions will report to the executive vice-president, distribution.

MICHAEL S. REFORD has been named chief geophysicist for the Aero Service Group, a worldwide organization of air survey companies, in Philadelphia. Reford joined Canadian Aero Service, Ltd., five years ago, in Ottawa, to direct survey planning and operations, and to interpret airborne geophysical data. Presently he is engaged in the planning and technical direction of airborne geophysical survey programs in Australia, Egypt, Morocco, Uganda, Chile, Canada, and the United States. Reford has also been associated with Mobil Oil of Canada, Ltd., where he supervised gravity, magnetic, and seismic surveys, and was also placed in charge of its geophysical operations in western Saskatchewan.

M. S. Reford

T. Tefertiller

THOMAS TEFERTILLER moves up to district manager of the Oklahoma district for the oil tool division of Chicago Pneumatic Tool Co., with headquarters in Oklahoma City. Tefertiller, who joined Chicago Pneumatic in 1955, became assistant manager of the Oklahoma district last year.

JOHN ERWING and **WILLIAM W. CHAPMAN** have joined the engineering staff of Tyson Smith Co., Houston manufacturer of oilfield process equipment. Erwing will serve as a process engineer at Houston, and Chapman will work in sales and service, with headquarters in Pampa, Tex. Erwing has been associated with Butler Mfg. Co. and Delta Tank Mfg. Co., and Chapman was formerly with Petco, manufacturer of oil and gas process units, and Manning, Maxwell & Moore.

RONALD L. VINGOE has been promoted to chief field engineer of the tubular department of the National Supply Division, Armco Steel Corp., with offices in Dallas. He succeeds **Charles C. Brush**, who has been appointed field engineer at Houston. Vingoe, who joined the company in 1952, has served as assistant plant metallurgical engineer, plant metallurgical engineer, and assistant superintendent of inspection.

SAMUEL D. HARPER is manager of a new computer department in Minneapolis-Honeywell Regulator Co.'s special systems division, at Pottstown, Pa. The new department will be responsible for engineering and marketing programs for integrated industrial process control systems incorporating the Honeywell 290 digital computer. In addition, it will coordinate activities with the company's electronic data processing division, industrial products group, and other divisions, in the design of products for control systems. Harper was most recently director of sales engineering for Honeywell's electronic data processing division, and before that was project director on the design and early stages of production of Honeywell's 800 computer.

S. D. Harper

W. A. Finn

WILLIAM A. FINN has been elected vice-president, group executive, of Worthington Corp., Harrison, N.J. Finn was formerly general manager of the company's Harrison division. **A. Edwin Carter** will become vice-president and general manager of the Harrison division.

SEARCHLIGHT SECTION

ANOTHER LARGE AUCTION—QUITTING BUSINESS

Continental Marine Exploration Company

Drilling Equipment, Barges, Engines, Drill Pipe, Generator Sets, Etc.

HOUSTON, TEXAS

Beginning Monday, April 10, 1961 at 10:00 A.M. and Continuing Until Sold.

Sale Will Be Conducted on the Old Jess Edwards, Inc. Yard off Industrial Road in Greens Bayou. Equipment May Be Inspected Anytime Beginning March 15 Until Time of Sale.

Everything Sells to the Highest Bidder Without Minimum or Reservation.

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This Is Everybody's Fight Now

IF THE FEDERAL POWER COMMISSION refuses to lift its recent ban on "indefinite" price clauses in natural gas contracts, it will kill off one more incentive for independent producers at a time when they need help and encouragement, not more problems.

The way things have been going for gas producers in recent years, it's almost a wonder that many of them have any desire to stay in the business. And this FPC edict is just one more hefty kick in the pants for them.

The ban on indefinite price clauses is scheduled to go into effect Monday. Producer groups, notably the Independent Petroleum Assn. of America and the Texas Independent Producers & Royalty Owners Assn., are fighting it, and already have appealed to the commission for reconsideration.

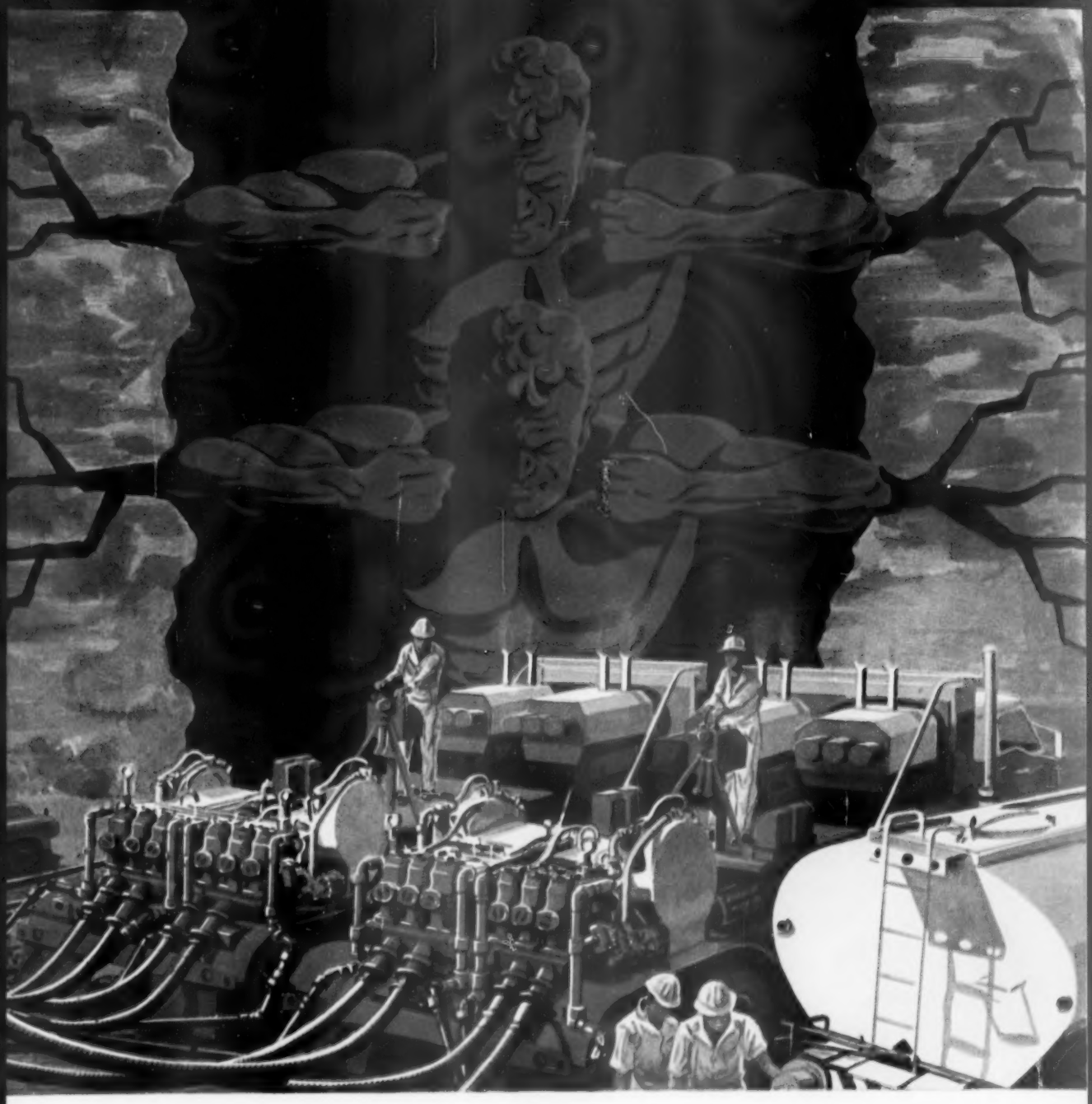
How far they'll get is questionable at this point. FPC has shown a strong distaste for indefinite price clauses right along, and now that it has taken a public position on the matter, it will be all the more difficult to persuade it to change its mind. But that's what will have to be done, and the independent producers' fight certainly deserves the support and encouragement of all gas producers, and everyone else interested in fair play.

THE CONTRACT CLAUSES affected by the FPC ruling are those involving renegotiation, redetermination, and favored-nation provisions. They're a bit too technical to go into here but, in brief, they are the only real protection for a producer against higher costs and appreciation in the value of his gas.

If the ban is allowed to stand, then the independent producer will be as boxed in as a man can be. When he signs a contract for his gas, he can stipulate periodic increases at set levels. And he can—if FPC approves—raise prices if operational taxes go up. But that's it. He has no guarantee that these contracted prices will represent going prices five or ten years hence, or whether they'll even be profitable. And since the U.S. Supreme Court ruled last summer that gas sales are for the life of the reserves, not just the dates specified in the contract, this means that the producer is wedded forevermore to whatever deal he makes today.

THAT COULD BE 20 years or 40 years or 60 years. And it would take a heap of crystalballing to figure out an escalation rate that could look that far down the road, and be fair to all concerned. That's why the indefinite clauses are better all the way around. We agree with the contentions of IPAA and TIPRO that this FPC ruling is regressive and unwarranted, and should be reversed.

Producers are entitled to a fair shake, not another shaking out.



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Which treatment makes the better well ?

These inside-the-well-bore views of enlarged sections of treated formation, as visualized by an engineer, compare two methods of stimulation.

The top illustration represents a sand-packed fracture after conventional fracturing. This type of treatment often gives good production increases at low cost. Many wells, however, do not respond profitably to these treatments. Small production increases, rapid production declines, or trouble with sand returns may limit profits.

The bottom illustration depicts the probable result of a new type of Dowell treatment. It uses slow-reacting Retarded Acid injected at a high rate to create open flow channels over a large drainage area. Since the etched formation supports itself, there is no need for using sand that might crush, imbed, or flow back with production. This new treatment technique is giving excellent production increases in many areas.

Which treatment is better for you? Your Dowell representative can help you decide when he knows the facts about *your* well, *your* production requirements and *your* profit objectives. Check with him now! Dowell services and products are offered from more than 150 offices and stations in the United States, Canada, Venezuela, Argentina, Germany, France and the Sahara area. Dowell, Tulsa 1, Oklahoma.

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